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COMPUTER WEEKLY

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Briefing

ICL bonuses in June

PRODUCTIVITY bonuses are to be paid to ICL employees in June following better trading performance during the first three months of this year. The company says it is unable to say yet what the exact percentage will be as this depends on the half-year accounts which have to be approved by the board and presented to the Stock Exchange before being announced. But it is assumed to have the bonus in the June pay packets.

No bonus was paid in the first quarter of the company's financial year, October to December, because trading did not achieve the required 10% increase.

Jobs galore

A SURVEY by the US Department of Labour predicts that there will be jobs for half a million programmers and systems analysts in the US by 1985, but not without changes in job functions brought about by technological advances. While the market for computer jobs will still expand faster than most other occupations, its rate of growth will slow down as software becomes more usable by non-technical people, the report says.

TI price cuts

PRICE cuts of between 7% and 19% have been made by Texas Instruments on its Series 700 VDUs, model 810 impact printer and model 742 programmable terminal. In addition, TI is offering improved discount terms for its model 743 printer terminals and a changed leasing structure across a range of its Series 700, Silent 700 and Omni 800 terminals.

Benchmark trials

AN ICL 2980 at the UK Atomic Energy Authority at Risley, Cheshire has passed benchmark trials with a claimed performance improvement of over six times compared to an ICL System 4/72, which it is replacing. The tests involved a mixed batch workload and supporting 64 terminals.

Viewdata delays

INDUSTRIAL action by the Post Office Engineering Union, which started last October, is now holding up progress on viewdata systems as well as delaying the installation of telephone exchanges and other equipment valued at more than £3 million.

Fairchild's reply

IN answer to the Data General law-suit in the US dealing with the misappropriation of trade secrets, Fairchild has asked the Chancery Court in Delaware to dismiss the case. The case involves the Fairchild 9440 16-bit micro announced in January 1977 as a Micro Nova software "look alike", and introduced a year later with revised software (January 30).

SRC calls for £5m research

A PANEL of the Science Research Council has proposed that a collaborative programme of research in computer science and applications be initiated, costing about £5 million over the next few years.

The panel, chaired by Derek Roberts, managing director of Plessey Microsystems, wants the programme to cover three main areas, new applications, education, and new technology, and the views of industry and the universities are being sought so that a firm programme can be drawn up.

The new applications being considered include the industrial impact of image processing, automatic inspection, industrial robotics, and speech recognition. The applications must be important and urgent.

As an alternative to these separate topics, the SRC panel thinks that a single large national project could be set up aimed at the solution of a problem such as disaster prevention, traffic control (air or ground), the wired city, or the automated home.

One useful contribution to education that the panel can see would be the development of a cheap computer for schools, costing as little as, say, a film projector.

The panel would like to work in new technology to be based on a single large project, either hardware or software, that could benefit all sectors of the industry. An example would be the development of a complex of different computers all co-operating with each other. Such a design would involve several new technologies such as fast hardware (gate arrays and hybrid construction), new memories (bubble and laser) and narrow communication channels (optical fibres).

Fault-tolerance both in hardware and software would be an aim in this system, possibly by having a distributed operating system with no master computer.

A less ambitious alternative would be the development of a new 32-bit midi computer suitable for a range of scientific and commercial applications.

Roberts . . . call for more collaboration in research.

E-series data leaked in Japan

AN investigation by IBM has revealed that over-enthusiastic Japanese salesmen have been giving potential customers advance information on the company's forthcoming E-series, which is to replace the lower end of the 370 range. IBM in a statement said it had taken "appropriate action."

The salesmen have apparently been telling customers that the new line will be announced shortly, and that it will offer double the performance of the existing 115 and 125 at about the same price.

This ties in with details of the E-series published in Computer Weekly (December 8, February 16).

Meanwhile, the US Justice Department has finally concluded presentation of its anti-trust case against IBM, three years after the trial opened. IBM has begun its defence, and the case is expected to run well into the next decade.

Commenting on the case at the annual shareholders' meeting, IBM chairman Frank Cary said the US government wanted IBM to introduce fewer new products and charge higher prices.

Olivetti-Stack talks

DISCUSSIONS are under way between Olivetti and Stack, the German-based company formed by ICL, Nixdorf, Control Data and Plessey to specify and place bulk purchase orders for semiconductor components.

Siemens to sell Fujitsu systems

By Tim Palmer

THE Japanese challenge to IBM in Europe has taken a major step forward with an agreement which allows Siemens to market the Fujitsu M-180II and M-200 large-scale mainframes. In return, Fujitsu is to buy, on an OEM basis, the Siemens' ND-2 laser printer, which ICL is also buying.

The agreements have been reached after two years of intensive negotiation, and were foreshadowed in Computer Weekly earlier this year (CW, February 2).

The agreement allows Siemens to market the Japanese machines in most European countries. The UK is covered by the agreement but Siemens has not yet decided whether it will enter the UK mainframe market.

Siemens will initially sell the machines with the Fujitsu OSIV/F4 operating system, which is claimed to offer all the facilities of IBM's MSS and to provide between 20 and 30% better throughput on a comparable machine (CW, March 2).

The M-series machines include the full IBM 370 instruction set and 10 additional instructions.

The M-180II approximately matches the power of the IBM 3032 or 370/168. The M-200 is a multiprocessor system which in its maximum four-processor configuration is about three times as powerful as a single processor and a formidable five times the power of a single processor 3033.

The IBM two-processor version of the 3033 will approximately match the power of a uniprocessor M-200; but IBM's machine will not be available until the end of next year, whereas the Fujitsu machine is due for autumn delivery.

It appears that, in deference to Amdahl, Siemens is not to market the Fujitsu M-190. The M-190 is in essence an Amdahl 470V/6 with 10 additional instructions. However, the forthcoming Amdahl 470V/6 is a completely new processor unrelated to the M-200, and the 470V/5 is a stripped-down V/6, and unrelated to the M-180II.

Siemens' top German-built machine is the 7,760, which matches an IBM 3031. The company was planning to introduce a 7,770 to match the 3032, but is now putting the development effort which went into this machine into a larger processor to match the 3033.

Rather than add microcode to its 470 processors, Amdahl is providing software support for IBM's MVS Systems Extension, and says the facility will be available later this year. The company will thus retain full compatibility with the IBM operating system. Amdahl has also cut memory prices on the 470V/5 and V/6-II by about 25%, reducing overall system cost by about 5%. Memory will in future be offered in minimum quantities of 2 Megabytes.

Teesside Poly quits ICL

ANOTHER blow has been struck at ICL's medium/large system customer base with a decision by Teesside Polytechnic to switch from an ICL 1905E to a Univac 1110 worth about £500,000.

ICL has recently lost a number of existing users, such as Tesco and Norwich Union which have switched to IBM, and Gloucester County Council and Allied Bakeries which have moved to Honeywell.

Univac won the Teesside contract against bids from many manufacturers, which were eventually whittled down to a three-cornered benchmarking fight between ICL 2960 and 2970 systems, a Digital Equipment 2050 and the Univac 1110.

IBM users 'satisfied'

AN OVERALL satisfaction with the quality of IBM customer engineering is indicated in the results of a survey of 700 IBM users carried out by the IBM Computer Users Association.

Relations between the user and customer engineer manager was the only area where some improvement was seen to be required, and the CUA has recommended that more regular meetings be held between users and CE managers.

Users were asked 18 questions about IBM maintenance, including mean time between faults, how co-operative IBM's engineers are, parts availability and time to fix faults.

Users were asked to assign a mark out of ten for each category and the overall average worked out at seven out of 10, equivalent to very satisfactory.

The results were markedly more favourable to IBM than the results of a similar survey carried out by the CUA in 1974.

The results of the latest survey were formally presented to CUA members at their annual conference in Bournemouth last week.

PRODUCTION PROBLEMS

COMPUTER WEEKLY is still restricted in size because of production problems beyond our control, but our tight packed pages still carry all the essential news for and about the computer industry and its customers. Ian Benson of the technical staff union TASS, writes about the role of computer people in the setting of Britain (Page 4) and in Top Spot Bernard Allen looks at the kind of union that would best serve the interests of operations staff (Page 13). Tim Palmer previews the big Brussels show, Compex Europe (Page 15), and Rory Johnston looks over the programme of Eurocomp 78 (page 14). There's also Software File, Programmer Notes, Lapers, and the final byte of the Hexadecimal Kid's 14-stage . . . but he will be back soon to continue his fight against the System. All this as well as all the up-to-the-minute news of the industry.

INSIDE THIS WEEK'S CW.....

APPOINTMENTS — PAGES 17-39

COMPUTERVIEW

COMPUTER people are increasingly looking to unions to further their interests and protect their rights. But are the established trade unions geared to meet the special needs of computer staff?

In Op Spot over the past few months, Bernard Allen has reported a growing mood among operators who are looking for organisations to join which would help them negotiate for better terms of employment.

Many operators said that only a separate operators' union could be of any real benefit, because they felt existing bodies did not understand or care about their special problems.

As reported this week (page 13), it seems as if operators studying the problem are beginning to realise that they will need to work within the existing framework. Many unions are beginning to become aware of the special needs of computer staff and already know the tricks of the industrial relations trade.

Unions and computer people

And on page 4, a leading trade union activist in the computer industry, Ian Benson, makes the point that computer people could have a vital role to play within the trade union movement by providing informed advice on the social, industrial and economic impact of information technology.

As Benson points out, the "humanising of technological change" is one of the major issues of our times.

Given the power structures existing within the country, it is clear that the trade unions will play a key role in assisting or blocking any changes.

Computer people are not a breed apart from the rest of the world, except that they are generally lucky to be in a relatively lucrative career — more so on the systems than operations side — and have little short-term fears of unemployment.

Like other people, many computer staff join unions primarily for reasons of self-interest. But the considerable historic achievements of the trade union movement have also been based on a collective concern for others.

Computer Weekly cannot advise any individual on whether or not to join a union or which union to join — that is a matter for the individual.

But [illegible] goes urge those who decide to join unions to help inform their colleagues in other industries and professions about the nature of their technology and its impact, as well as involving the union in negotiating about their own particular work environment.

FOCUS

IT is no exaggeration to suggest that the success or otherwise of any computing system depends largely on the relevant input. Probably more applications have come unstuck through faulty input design than any amount of human interface, incompetence or involvement.

However, Focus believes that Tom Gilb (CW, April 20) has got himself looped and buffered, if he really believes that little progress has been made in the past 42 years in respect of input coding techniques.

Bring out the systems analyst

For a start, ledger keepers of 40 or so years ago, would probably be more familiar with the Morse code than data input procedures. PAYE and National Insurance codes had not even been devised in those earlier generation days.

Input developed very much along traditional clerical methods. It was usually the computer which had to adapt.

Unless input forms and formats are logical and traditional, resentment reigns supreme.

It seems it is the system designer who is most in need of education and training. Not, however, at the familiar "standard" training of NCC origins, which are noted for producing identikit analysts.

What should be urgently promoted are system courses which result in independent thought and action. Few applications fit into defined and approved structures. Each and every project should blow preconceived notions.

Somehow, the system analyst, especially those with foresight and aptitude, must become involved at the early stages — not as is all too typical, to be released on to the scene long after the decision has been made and time-scales set.

The presence of the analyst should be extended beyond that of attending initial project meetings. He should be present at all sessions involving user applications and services. In fact, every sales team should be equipped with its quota of analysts. It is all too easy for the professional salesman to concentrate solely on convincing the prospective customer with the excellence of his range of wares.

Unless the systems analyst is put on the early warning list, data input could well continue to be the poor relation of the DP industry for the next 40 years.

INTERRUPT

IN the days when going online was The In-Thing, a book publishing company decided to design an online production system.

Brain power and design power were poured into getting the online system right. The procedure was that the text and corrections of the book were input from VDUs, with each section of the book handled by a different operator.

As a secondary concern in the systems design phase was an offline system to be used to carry out line and page formatting, collation and page numbering. When the system went into operation, the online activity worked well . . . but the real bugs were to be found in the offline procedures.

There are two morals to this story: To every real time system there is an implicit batch element that must not be underestimated. Or, more succinctly, Don't count your Dickens before they are batched.

● This week's £6 Interrupt prize goes to R. F. Bristow of Vantaa, Finland.

Ten years ago...

COMPUTER WEEKLY MAY 2, 1968

SUSPECTED pirating of the Boadicea real time control system was being investigated by BOAC and IBM, with a view to bringing a civil action . . . Bull-GE of France and Tesla of Czechoslovakia signed an agreement for the manufacture of the Gamma 140 by the Czechs . . . The PO's National Data Processing Service was under way, and had begun to take in work from customers outside the Post Office . . . The "desperate shortage of trained personnel" continued. Keele University was offering £1,105-£2,270 for a senior research assistant to provide hardware and software support on a PDP/8. . . . The GE130, the first in GE's range to use integrated circuits, was announced at the Hanover Fair.

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Editor
Malcolm Peltu 01-261 8033
Deputy Editor
Tony Higgins 01-261 8696
Advertisement Manager:
Harry Hutson 01-261 8359
Class Ad Manager.
Brian Durrant 01-261 8028
IPC Electrical Electronic Press Ltd, Dorset House, Stamford Street, London, SE1 9LU. Telephone: 01-261 5000 Telegrams/Telex: 25137 BISPRS G
British Offices:
Birmingham: 202 Lynton House, Walsall Road, Birmingham 22B Telephone 021-356 4838
Manchester: Statham House, Talbot Road, Stretford, Manchester M32 Telephone 061-872 4211
New York: 205 East 42nd Street, New York NY 10017 Telephone (212) 867 2080 Telex 421 710
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Defective memory parts 'sold in UK'

DEFECTIVE memory components that evaded the scrapping process at the US manufacturers, Advanced Micro Devices, may have been sold in this country.

The components, 2K bit EPROMs of the 1702A type, came to light through two small distribution companies, in [illegible] and OK [illegible] of which are [illegible] California [illegible] Electronics [illegible] now being sued by AMD for alleged trademark infringement.

American reports suggest that the forgeries may have entered the UK via International Component Supplies.

AMD is currently investigating how [illegible] escaped the scr[illegible] and has issued [illegible] the components how to spot the [illegible]pping process. The major diff[illegible] information on shape and [illegible] forged branding. numbers, the [illegible]rence is in the narrower [illegible] spacing of the spaced [illegible] official part having gate[illegible] and more widely [illegible] numbers than the for-[illegible]

[illegible] it bought some of the components from one of the un[illegible] distributors, one of AMD's official distributor companies, Cramer, has had its contract terminated. In the UK Cramer also handle AMD parts, but the British company has not been disenfranchised.

Saving contract staff from exploitation — aim

PROTECTING its members involved in contract programming from exploitation by some recruitment consultancies is one of the main priorities of the Association of Independent Computer Specialists, which represents consultancies of under 20 people.

Speaking last week at the launch of a new handbook describing members' services, AICS secretary David Morton told Computer Weekly that one of the major concerns of the AICS is to combat some of the worst effects on members and clients who obtain contract programming services through some recruitment agencies which do not meet the required standards.

DAVID MORTON . . . ." these cases need to be exposed."

"There are problems like being pressured to deceive clients, or finding that you have worked a whole month for no pay, although the client has sent his cheque to the agency. These cases need to be exposed and dealt with by carefully planned measures," said Morton.

The recruitment division of the Computing Services Association has a code of practice (CW, October 20, 1977) which is aimed at ensuring that its members do not become involved in this type of activity.

The new AICS handbook is aimed at keeping its members more effectively in touch with their market.

The association which was formed in 1972, holds meetings monthly at the National Liberal Club in London and sends out a monthly newsletter. Its headquarters are at 8 Leicester Street, London, WC2. Tel: 01-437 0678.

Announced at Hanover

THE new Univac UDS 2000 key-to-floppy-disc system, details of which were exclusively revealed in Computer Weekly (March 30), was formally announced at Hanover. The microprocessor-based system supports up to four keystations, each with up to two floppy drives, is backed with 32K bytes of memory and a Cobol subset is available as an option for customised data entry.

PRIVACY SAFEGUARDS INADEQUATE, SAYS BMA

Doctors object to child health system

THE privacy safeguards of a new child health data system are regarded as inadequate by the British Medical Association, which may recommend doctors to refuse to co-operate in the use of the system.

Plans for the "Standard Child Health Module, Pre-school Health Module", which would store medical and personal information about all children in England and Wales from birth to age five, have been criticised severely by the BMA's Ethical Committee, which claims that the safeguards on privacy will not be sufficient.

Nevertheless, the Child Health Computer Committee, which consists of representatives of the Department of Health, the NHS, and several medical associations, has decided to go ahead with the system, while issuing a statement of the ethics on which development of the system would be based.

The BMA has said that this statement does not answer its objections.

The Ethical Committee is concerned that print-outs from the system would contain information about how many abortions mothers had had, the social backgrounds of parents, and a large amount of clinical data, and that the security of this information would not be adequate according to the design of the system as proposed.

Dr John Dawson, the committee secretary, said, "Any information that a patient gives to his doctor must be kept private, if the style of medicine that we have in this country is to continue."

The committee warned doctors that they would be behaving unethically if they supplied information to the system, and might find themselves in trouble with the General Medical Council.

The Child Health Computer Committee, in approving the proposal despite the BMA's objections, stated three ethical principles that it said would govern the system:

● Identifiable information should not be used for purposes other than those for which it was supplied without the consent of patient or guardian.

● Access to such information should be confined only to those who are clinically responsible for the patient.

● Data supplied for research should not be identifiable to a particular child, except where individual follow-up is necessary for the research.

The computer committee has said that it expects these principles to be acceptable to the medical profession. It has passed the proposals to the Welsh Health Technical Services Organisation in Cardiff, which will produce the design of the system.

A spokesman for the BMA said that the principles were fine as far as they went, but they did not answer the questions raised. There were no guarantees that what they said would actually happen.

The Ethical Committee will be meeting again to decide what to recommend to doctors.

FACED with increased overheads in their modern and expensive home the tenants of New Covent Garden market are now seriously looking at computers as one way of reducing their costs, and one firm, Barney Springer, has taken the plunge and installed a Logabax LX4500.

To celebrate the event and maybe persuade a few other traders to follow suit, Logabax installed an LX4500 demonstration system in the Apples and Pears, a pub in the vast concrete and steel complex.

Seen here is one of the few remaining "characters" from the old market, Dick Turpin, who is trying his hand at the keyboard of the LX4500, helped by an amused Bob Andrews, the Logabax Croydon branch manager.

Burroughs adds four models

FOUR new models of Burroughs' top-end B6800 line have been announced; together with five models in the medium-scale B28-38-4800 line. The company is also reported to be working on new large disc drives offering over 300 Megabytes per spindle.

The new 6800 models are the 6808, 6812, 6818 and 6822. They feature 16K-bit MOS memory chips and replace the four existing models. Purchase prices of the latter have been cut by 18%. The improved memory boosts performance by 40%. The top machine, the B6822 consists of a minimum of two B6812 processors, and can include up to four.

The new mid-range machines are the B4865, which takes up to a Megabyte of main memory and cyles at 125 nanoseconds; the B3845 and B3805, both of which cycle at 250 nanoseconds and take a maximum of one Megabyte and 512K bytes respectively; and the 660 nanosecond B2835 and B2805, both of which can grow to 512K bytes.

National spurns 8086 and plans its own third generation micro

ALTHOUGH it has been a strong supporter of the Intel product line, National Semiconductor has decided not to second source the Intel 8086 16-bit microprocessor, and the reason may be that it has its own plans for a third generation, 16-bit device.

National has been second sourcing the Intel 8080 for some time, and has developed a wide range of interface and peripheral chips to go with it. The company will also be second sourcing the 8048 and 8049 single chip microcomputers from Intel, together with the 8243 I/O expander device.

But according to the company's director of computer and industrial marketing, Stoney Edwards, National is in the final stages of perfecting a new OS manufacturing process that will be known as XMOS.

Using a narrow silicon gate derivation of the NMOS process, it is claimed to exceed the performance capabilities of both VMOS and HMOS, the latter being the process used for the 8086. It is also, according to Edwards, eminently suitable for the coming production techniques of electron beam diffusion and X-ray lithography.

The first products using the new process are expected to be announced in about two months.

Although Edwards could not confirm any details of the new National micro, it is believed to be about 18 months away, and will be produced in the new XMOS process. Like the early claims being made by Motorola for its forthcoming MACS micro, the National device is expected to outperform the Intel 8086.

Sources close to National indicated that the company thought the 8086 was "too little too soon", and was more of a second generation and a half device, rather than a true third generation part.

Alternative to 370/138

A PLUG-COMPATIBLE alternative to the IBM 370/138, manufactured by National Semiconductor, is expected to be unveiled next month. National Semiconductor already builds the AS/4 and AS/5 Advanced Systems, sold by Itel as alternatives to the IBM 370/145, 158 and 3031.

Meanwhile, Amdahl, which build the AS/5 computer, sold by Itel as an alternative to the 3032, has a new machine, the M210, which Itel is likely to introduce as the AS/7.

The latest entrant to the IBM "look alike" business, Magnuson Systems (CW, November 10, 1977) will formally launch its range of machines next month, aiming at the small/medium sized 370 market.

GIM into personal market

A DIFFERENT approach to entry into the personal computer market is being considered by General Instrument Microelectronics. If successful, it could give the company a reasonable stake in this potentially lucrative market, while removing some of the problems of a component manufacturer vertically integrating into systems.

GIM has come to agreement with three companies, one in the US and two in Europe, to supply component and board "packages". The three companies would then be responsible for producing and marketing the personal computer systems.

As part of the GIM package, the company is developing a Basic interpreter.

Can computer staff save Britain?

By Ian Benson

"HUMANISING technological change has been the business of the Labour movement from its inception." That is the claim of Ian Benson, divisional organiser of the TASS administrative and supervisory section of the Amalgamated Union of Engineering Workers, and chairman of the NEDC Computer Manpower committee. Benson, one of the most active trade unionists in the computer field, explains in this article why he believes that, in taking up the challenge "issuing from the croquet lawns of Hedsor Park" — venue of last year's ACM/Computer Weekly conference on Can computers save Britain? — the collective voice of computer professionals allied via the trade union movement to their colleagues in industry will prove to be of major significance in finding solutions to the social and other problems that are being posed by the challenge of information technology.

WHEN software houses were nothing but a twinkle in the eyes of budding entrepreneurs, TASS, the Engineering Staff Union, was learning to deal with the introduction of computers into the manufacturing process.

Humanising technological change has been the business of the labour movement from its inception. Indeed, it owes its very existence in part to the activities of small groups such as the followers of General Ludd, who opposed the introduction of the factory system itself at the turn of the 19th Century.

The Luddites had considerable public support, as E. P. Thompson noted in The Making of the English Working Class: "What was at issue was the 'freedom' of the capitalist to destroy the customs of the trade whether by new machinery, by the factory system, or by unrestricted competition, beating down wages, undercutting his rivals and undermining standards of craftsmanship."

Although the Luddites were eventually defeated in their campaign of direct action to resist the spread of the factory system, their activities were indirectly an influence on the widening of the franchise, and a century of progressive legislation on the formation of trade unions and the regulation of conditions of employment.

As the labour movement has developed, its attitude towards technological change has had close links with the prevailing level of unemployment.

As late as 1965, the TUC could write: "The contrast between the present day and the position a century ago is dramatic. Any trade unionist of that time with the ability to foresee the technological changes that had taken place in the past century, might well have feared that all the goods and services produced a hundred years ago could have been supplied with modern techniques with a fraction of the 1870 labour force. In fact, scientific and technological change has made many new products possible and our requirements have increased at least as fast as industry's ability to meet them."

The TUC took comfort from the fact that there was a consensus of opinion among the political parties that "mass unemployment is the result of ineffective or erroneous economic and social policies or the failure of the institutions concerned with these policies or both, rather than of technological change itself."

Now, with the Manpower Services Commission prophesying a shortfall of jobs of some 2.3 million in 1981, attention is once again concentrated on the potential of technology to destroy jobs, and it is the computer which is bearing the brunt of the scrutiny.

The European Metalworkers Federation, which groups Western European engineering unions, adopted a document on the development of data processing last November which stated, "The EMF in no way shares the optimism of certain governments, employers and the European Commission that the new technologies in the field of informatics will have a favourable effect on the employment situation in general and the number of jobs in particular."

The TUC has gone further and expressed concern about the way in which the introducing of computer systems changes the flow of information in enterprises, and makes it more difficult for workers to understand and control the processes which dictate the pace of their work.

At the sharp edge of the technology, computer staff themselves have seen this happen. In recent years they have seen to varying degrees the de-skilling of jobs, the quickening tempo of work and the spread of unsocial hours working.

De-skilling is perhaps most apparent in programming areas. Here automation of computer program writing made possible by more powerful machines has enabled the boundaries of the division of labour in these areas to be redrawn. There has been a growth in so-called "chief programmer team" organisation which breaks down programming into a range of routine designing, coding and testing operations, carried out by staff of lower qualifications grouped around one or two specialists.

Meanwhile, operations staff have been increasingly required to work systematic shifts. So much so that their general level of pay now reflects a substantial element of shift premia. It has risen 172% over the last five years compared to programmers who have only received an increase of 100%. An unfortunate side effect of the reverse differential that this has introduced into pay structures has been the difficulty it has caused to career progression.

As staff become exposed to forces which their shop floor colleagues experienced with the introduction of mechanical mass production technology so they have increasingly turned to collective action to defend their interests. The rush to join trade unions began in earnest in the late sixties. TASS for example, the largest staff organisation in engineering, doubled its size to 170,000 between 1970 to 1977.

Even computer staff have become increasingly militant. Within TASS, the central government and bank unions, they have established their own representative structures. Their battles for trade union recognition have been every bit as bitter as those of their predecessors.

This increase in membership represents growing strength to the trade union movement. Computer staff in particular bring with them considerable industrial potential.

But this is not all they bring. As the debate initiated in the columns of Computer Weekly and elsewhere about the human use of their technology takes its roots in the labour movement, it is essential that their collective intelligence is applied alongside that of their colleagues in industry to the solution of these new social problems.

Who knows? it might even be the case that it will be their voice, taking up the challenge issuing from the croquet lawns of Hedsor Park, which is remembered when the history of our time comes to be written.

Chad is on holiday. Downtime will be back soon.

Plugging the gaps in DP insurance

RISKS not covered by manufacturers' maintenance agreements are covered by the policies now offered to computer users by a new firm in the business, Computer Insurances Ltd.

Its policies specifically cover for short circuits and electrical disturbances and include damage caused as a result of electrical and mechanical derangement. Damage due to employees' negligence is also covered.

Apart from insuring installed machines against damage Computer Insurances is also prepared to provide cover for machines in transit by road or air, and for engineers who work for independent maintenance firms against mistakes that cause damage during installation.

The two main types of customer being aimed at by Computer Insurances are leasing companies and users of very large machines, either purchased or on lease, in the latter case where the insurance of the machine is the responsibility of the lessee.

The firm's managing director, ex-IBM account manager Alwyn Farey-Jones, says that some big computer users have lost a lot of money through electrical supply damage or mechanical derangements like core memories falling apart because neither the supplier nor the insurer had agreed to cover the cost of repair.

CI policies are directly related to the protection provided by manufacturers' maintenance agreements in such a way that risks not covered by the agreement are covered by the policy.

Other insurance areas being considered by Computer Insurances include providing cover for consequential loss — the overall effect on a business of its computer breaking down — and fidelity guaranteeing. This would involve insuring the trustworthiness of an employee in an installation.

Computer Insurances is a division of a much older insurance broking firm, Farey-Jones (Insurance) Ltd of Chipstead, Surrey. CI's telephone number is 01-580 5816.

Fire safety views wanted by BSI

A DRAFT of the newly-revised British Standard Code of Practice for the fire protection of DP installations is available for public comment.

The committee which produced the draft had differing views on the need for, or hazards of, installing total gas flooding and/or automatic sprinkler systems in computer areas. Views are sought on this and other aspects of the draft.

Copies of the document are available from the BSI General Office, 101 Pentonville Road, London N1 9ND. The price is £1.50, and the last date for comments is the end of June.

ICL plans to move 1,100 W Gorton jobs

MOVEMENTS of assembly work on its large systems from West Gorton, Manchester, to a new site three miles away at Snipe Industrial Park, Ashton under Lyne, has been proposed by ICL. The company is seeking planning permission for a new 143,000 square foot factory at the site.

If the move is approved by the ICL board and Tameside Council, the local authority controlling the proposed site, it will involve about 1,100 staff now engaged in the assembly work. Also, about 470 staff manufacturing printed circuit boards at the West Gorton factory are to be moved to another nearby site at Upper Brook Street, Manchester where planning permission has already been granted.

These moves would leave about 1,400 product development staff at West Gorton occupying a new tower office block there. One of the main reasons for moving the other two groups is that more modern facilities are needed.

Earlier this year (CW, February 23) ICL gained planning permission for a site at Simonsway, Wythenshawe, south of Manchester, to build a research and development centre, but the option was not taken up.

Good news for Amdahl

FOLLOWING its first Italian installation at the Finance Ministry (CW, April 27), Amdahl Corp is negotiating four other contracts with various government agencies in Italy. Amdahl has installed its first system with Simca in France (CW, February 22), and a second 470V/6 is on order for this French Chrysler subsidiary. The systems are two of six ordered by Chrysler from its Detroit head office.

Nips system market aim

AIMED at small to medium sized manufacturing companies, the Nixdorf Inventory and Production Control System has been launched at £30,000, or £850 per month for hardware, software and maintenance.

Developed by Computer Systems Developments of London, Nips will run on the minimum Nixdorf 8870/1 disc based computer which already has a user base of 1,500 systems throughout Europe.

Programmed in Basic, Nips comprises five modules: inventory management, bills of material processing, material requirements planning, production control, and costing.

As a transaction is entered from a terminal in the relevant department, part numbers or supplier codes are checked against master files, and when a valid transaction is completed all relevant master files are updated. It is then possible to display or print any one of the up-to-date system reports.

9400 conversion aids on 90/40s

THE new Univac 90/40, announced last week (CW, April 27) provides a wide range of conversion facilities for the OS/4 operating system used on the 9400 and 9480, but does not actually run the operating system.

The conversion aids to enable users to migrate to the modern OS/3 used on the 90/30 and 90/25 include support for almost all the old peripherals; comprehensive translation aids for assembler programs, files, libraries and the job control language; and financial incentives to encourage users of the old Univac machines to migrate.

No comprehensive prices have been published for the machine in the UK, but Univac says that a typical configuration with 512K bytes of memory sells for about £300,000.

The new machine comes with a minimum of 200 Megabytes on disc, expandable to a maximum of over 3,000 Megabytes. Main memory expands from the basic 512Kbytes in 128K byte steps to one Megabyte.

The memory cycle is enhanced to 500 nanoseconds, compared with 600 nanoseconds on the 90/30, and a new instruction pre-fetch facility improves processor throughput by 30%.

GILB'S MYTHODOLOGY

Structuring primarily for machines, not people

WHY have you considered "structured programming"? Perhaps to avoid misinterpretation I should use the term structured coding? Better still, to emphasise the fact that the logical paths are organised in some special manner, I shall use a new term, "structured logicware."

In any case the subject of discussion is on various ways of structuring program logic for the same functional program, so as to produce various desirable effects.

My initial question is, therefore, which effects do you expect?

The general expectation seems to be that somehow the programs become more readable, and thus more maintainable. As I have indicated earlier (CW Jan. 12 and Feb. 2) these expectations do not seem to correlate well with objectively measured facts. My personal opinion is that structured programming is not yet evaluated in a proper context. We are interested in it for the wrong reasons (human comprehension of program texts), and we go about getting SP in the wrong way

I am certain that the dominating reason why SP will become a requirement for all serious programming projects is so that logicware can be reasonably thoroughly tested, and retested after maintenance changes. This is not widely appreciated today, since so few of us even have a primitive test completeness requirement (like proof that all instructions are tested at least once, or if they loop, twice).

When we realise that a 50 line program, which has 25 consecutive IF THEN constructs could have as many as 33.5 million distinct control paths then we see that thorough testing of all these distinct control paths is not even practical using machine generation of test cases and machine execution and evaluation of them.

My hypothesis is that we must use machines to "structure" our program control logic, and we must use machines to evaluate the degree of structuredness of such logic, to evaluate the degree of testness, to construct test cases, and to evaluate the validity of those test cases.

Thomas McCabe, of the US Department of Defence, Fort Meade, Maryland in a fascinating paper delivered at the October 1976 Software Engineering Conference in San Francisco, called "A Complexity Measure," described an automated technique, programmed in APL for PDP-10 Fortran text analysis, called "Flow."

Flow measures the number of linearly independent paths in a program, to get a measure of "cyclomatic complexity" which corresponds to human intuitive ideas of complexity and experienced difficulty of testing the program. He shows that complexity can normally be limited to upper limit of ten (linearly independent paths) *independently of the physical size of the programs!* He also reports measuring factors of 16 to 64, in subroutines, for a real time graphics system which was reputed to be unreliable.

McCabe also found that several programmers who frequently wrote code in the 40 to 50 complexity range, claimed there was no other way to do it. He also observed that he could evaluate a year's worth of a single programmer's Fortran code in about 20 minutes, using the Flow complexity measuring tool, while at the same time noting that it is not really practical to expect programmers to do such complexity evaluations manually.

McCabe reminds us that structuredness is indeed a measurable concept, even automatically so – for that may be the only practical way of doing it. He also reminds us that programs of any complexity are "reducible" to some lower limit of simple logical flow, by a systematic set of rules.

The next obvious issue is whether or not we can get a machine to simplify our program logic structure. Indeed we can. The most prominent attempt is the structuring engine for Fortran (by Caine Farber and Gordon, Inc. of 750 East Green St., Pasadena, Calif 91101) which in addition to all sorts of elegant source code identification and analysis tricks, actually rewrites any old Fortran (Standard) so that the logical paths are simplified.

This is simply a logical extension of the concepts of "compiler," "optimising compiler," and other such aids. I have on my desk the initial listings of the first stages of a similar product for Cobol made by Don Dzamba at Bell Labs, Piscataway NJ, where the work for the moment is "on exposing the structure of the original Procedure Division," but where the objective is automatic restructuring.

There are many other developments which suggest the same conclusion.

I am all for humanising the work process of the programmer – too, but – the moment I can transfer the burden to my computer, then I'm going to do it.

GILB'S HYPOTHESIS: "Structuring is necessary for machines, not people."

SOFTWARE FILE-1

Adapso in legal clash over US patent refusal

A FURTHER round has been fired in the continuing battle in the US to obtain legal protection for software.

Adapso — the Association of Data Processing Service Associations — has again filed an "amicus" brief with the US Supreme Court supporting the position that computer software should be patentable.

Adapso's latest brief was filed in the case of Dale Flook versus the Commissioner of Patents and Trademarks. The action arises from the Commissioner's refusal to grant a patent to software developed by the Atlantic Richfield oil company.

The brief noted that "software is a new technology that is today viewed as the most critical and important element of a computer system. As in any new technology, for it to grow and compete, it needs all the protection due under the law. Adapso asks the court to treat software technology equal to hardware technology — no better and no worse."

An amicus brief is a device whereby a person who has no right to appear in a legal suit is nonetheless allowed to introduce arguments, authority, or evidence to protect his interest. This is the third occasion on which Adapso has supported a Supreme Court patent action in this way. Both earlier suits were rejected.

According to Jerome Dreyer, executive vice president of the association, one object of filing briefs was to document Adapso's position in anticipation of future applications to change the law.

Although all possible means of protection were still being investigated, he said, many members thought that that offered by copyright was not adequate. Some combination of a patent with a copyright might be suitable, or alternatively a completely new legal form.

The applicability of the 1975 US copyright laws to software is still uncertain, pending Contu's final recommendations to Congress (Software File, March 23).

One of those strongly in favour of patent protection is Martin Goetz, chairman of Adapso's software protection committee and a senior vice-president of ADR. Goetz said that "alternative means such as trade secrets and copyrights are both inadequate and inappropriate to the task . . . patents would permit software companies to have the same protection as hardware manufacturers."

As in its past filings with the Supreme Court, Adapso continues to maintain that software patents would provide important innovative talent, would stimulate technical progress and would protect an industry composed predominantly of relatively small companies.

Puzzler

THIS week's problem involves four numbers 1,105, 1,453, 1,844, and 2,281. Each of these gives the same remainder when divided by a certain "mystery" number. Can you work out this unknown divisor before turning to page 37 for the solution.

◆ Harking back to the Easter Egg puzzle (March 23) Moira Biggs, of the Computer Studies Department at Loughborough University, comments that a total of 1,296 + 1,296 + 1,296 = 11,150 also give a "square combined total" for each pair of crates — albeit only two different totals are involved. Thus time, although the inverted equation gives a "six square pairs", all different.

PROGRAMMER NOTES

'Basic name for each major variable'

CONTINUING John Murchland's suggestions for Fortran programming conventions. In part two, he now reaches the thorny subject of naming variables.

Naming conventions, he says, are more of a problem, "since it seems too large-scale a personal and psychological matter. I feel though that some logic is possible."

"What is needed is related names for related variables. Names should be created systematically so that a reader can anticipate what the names will be. This suggests use of a basic name for each major variable, with qualifiers indicating the relation of associated minor variables.

"Necessarily the qualifiers would have to be alphabetic characters used as a prefix or suffix, as Fortran has no break or special characters."

Murchland notes "suffixes are particularly attractive, since nearly every program has an idea with levels which have to be checked, and a suffix letter lends itself to choosing levels [illegible]

[illegible] logically, a complex, D double precision or double precision from C a single precision or integer quantity, E single precision or single precision version; I integer or integer form of a real quantity, and N number or dimension of [illegible]

Suffix L lower limit value of minimum, P past or previous value or prime, [illegible] sum or sum total or square, and U upper limit value or maximum.

A related Murchland convention is that the name for a variable equal to W(I), should be WI, which may seem easily confused with a subprint.

As examples, the dimension of a vector W would be NW, the number of cases would be NC or NCASES, a change in W over an iteration would be W-WP (current minus previous) or WI-WIP for the Ith element of W. Similarly large checks on variable F5 would be of the form IF(F5.LT.5..OR.F5.GT.5)

Readers may see flaws in his ideas. Correspondence is invited but readers are asked to include a day-time telephone number where possible.

Hamish Fyfe

SOFTWARE FILE-2 EDITED BY PETER HEWITT

Easit method of Euro classification

A NEW method for the classification of technical software products has been devised by a European study group. The guidelines established represent the first fruits of Easit, which earlier this month celebrated its first birthday with a conference in Paris.

Easit — the European Association for Software Access and Information Transfer — was set up a year ago with the aim of improving software services in Europe, chiefly for scientific and technical computer users (CW, April 14, 1977).

As part of its activities, Easit established six working groups to examine various aspects of software practice. Two of these have now reported: that working on program documentation and that considering software classification.

Primarily the work of Karl Zelle, of Graz, Austria with support from the European Computer Program Institute (Eurocopi) of Ispra, Italy, the new classification scheme is potentially of great significance.

Most attempts in the past have been either one-dimensional classifications (eg Share/ACM) or key-word systems.

Zelle's system, christened EPOS (Extended Problem Oriented classification Scheme for scientific software), is an elegant compromise between these approaches and could be used by a program librarian in either way.

An ambitious system, which currently contains some 4,400 terms, it now urgently needs critical comment from active workers in this field.

The working group on software documentation has turned in a massive report produced on its behalf by Paul Wolfangel of Mannheim. An extended critique of 25 different systems of program documentation, it includes a 52-page glossary of software terms. Both reports will be published in the near future.

Among speakers at the conference were Jeremy du Croz of the Numerical Algorithms Group and Ken Thompson of the NCC. Thompson is currently seconded to the EEC and he described the activity of the working group on standardisation which DG/3 has set up.

One aspect of this work is to encourage member states to support and implement standards through their procurement policies. This tactic for the enforcement of standards was strongly recommended by Captain Grace Hopper during her visit to London last month (Software File, March 16).

The DG/3 working group includes two people from each member state and also has close links with ECMA, ECSA (European Computer Services Association), and the newly-formed Conference of European Computer User Associations. (CW, March 2 and 16). Among other things, the group is studying the question of Cobol portability within the community (CW, November 24, 1977).

The difficulties of establishing standards were aptly highlighted by a subsequent presentation on behalf of the West German standards institute (DIN). This outlined proposed West German software documentation standards that run quite counter to other work in Western Europe.

This scheme is conceived in terms of software functions and is thus in sharp contrast with role-oriented methods, which seek to structure documentation in terms of the different types of user.

The West German scheme is also heavily formalised and, according to one delegate, does not necessarily bear much relation to the way software is structured in the real world.

In the UK, the London-based Study Group on Computers in Survey Analysis has been acting as the Easit working group on social science software. This group has previously examined the available software packages, under the sponsorship of the SRC (CW, January 20, 1977).

Its most recent catalogue, briefly describing 75 packages related to survey analysis, will be appearing in Computer Weekly in the near future.

SOFT BITS

More Scicon services

THE scientific bureau Scicon has increased the range of services offered to chemical engineers. A link has been forged between the Physical Property Databank Service, PPDS, and Harwell's shell and tube heat exchanger design program, TASC 2, thus short-circuiting otherwise laborious calculations.

The bureau has also made available a program for vibration analysis in heat exchanger tubes, Henvibs, developed by Perara and Associates.

A NEW affiliate company has been established in Mexico by Cullinane Corp, supplier of IDMS and other system software. The new company, Cullinane Mexicana, will provide formal marketing and technical support operations for the complete product line in Mexico and Central America.

SOFTWARE for a time recording and internal accounting system is to be developed by Systemsolve for London accountants Morley and Scott at a cost of about £25,000. The work will be run on an ICL System 10, on which Morley and Scott eventually plan to market computing services to outside customers.

A BRANCH office in Leeds has been opened by CRL-Abacus, complementing existing offices in London, Coventry, and Manchester. The Leeds office, has an initial staff of ten.

UK distributor sought by Swedes for Pathfinder

A DISTRIBUTOR in the UK is being sought by Stockholm software house Datannalys for Pathfinder, a diagnostic tool which traces the execution of each path in an ANS Cobol program (CW, August 29, 1974).

Dataanalys is currently negotiating with five UK companies and expects to reach an agreement before the end of May. A previous Dataanalys product, TDG-L test data generation language, was marketed in the UK by Gemini (CW, September 6, 1973) but the company says it is looking for an alternative agent on this occasion.

Pathfinder analyses the flow of control down to the most detailed logic level. It thus offers facilities superior to those of the Cobol TRACE option, which does not analyse below the level of paragraph names.

The package uses a preprocessor to locate each branch point in a program. At each node, a flag mechanism is inserted. After normal Cobol compilation, the resulting object code is linked together with a Pathfinder execution supervisor and dynamic reporting module.

During subsequent execution, Pathfinder generates reports on the program paths taken and executed and non-executed processes. It also generates frequency tables for those processes executed.

According to the developers, the main use of the package is to enable project leaders to assess the completeness of program testing. It can also be used to locate frequently-executed procedures as a guide to optimisation, or to locate unauthorised code in EDP auditing.

Written in Cobol, the package will run on any machine with an ANS Cobol compiler. It will sell for around £1,800.

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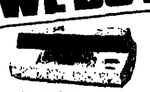

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Reorganisation and expansion at Wang

APPOINTED managing director of Wang Electronics is Herbert Bechtel, formerly manager of the Frankfurt office. He will have special responsibility for he computer division and the service, support and admin departments. He succeeds David Allett who had taken over the responsibility for Wang's dealer network in north-western Europe.

The word processing division of Wang has moved from Northwood to 27 Berkeley Square, London W1, tel: 01-491 4241. Raymond Redpath, formerly with Wang Europe in Brussels where he was responsible for building the North-West Europe dealer network, has become general manager of the division.

Reorganisation of Wang's computer division has resulted in the creation of two new branch offices. The Southern region branch is based at the HQ of Wang Electronics, Argyle House, Joel Street, Northwood Hills, Middlesex HA6 1LN, tel: Northwood 28211, and managed by Michael Pegg, formerly of British Olivetti.

A regional office at Myson House, Railway Terrace, Rugby, Warks, now services the Midlands area, and the manager is Frank Pipe, the company's top salesman in 1975 and 1976.

Also at the Argyle House HQ, Graham Wilson is promoted from sales executive to applications support manager, and Patrick Byrne, another former sales executive, becomes software support manager.

In the expanded office at Harrogate, Ian Campbell becomes Northern region manager. He was previously a computer analyst.

Tony Nicholson has joined BOC Datasolve as financial director. Formerly he was financial controller of the Heathrow Hotel.

Mike Knowles, previously a senior technical adviser on time sharing usage with ADP Network Services, has joined Redifon Computers as systems manager of the London branch. Robert Bagnall, who was until recently communications controller with Westminster City Council, becomes a systems analyst with Redifon.

John Maund has been appointed director, industrial engineering and manufacturing at Standard Telephones and Cables. He joins from Lucas Electrical where he was director and general manager of the electronics and systems division.

Rejoining STC, Peter Morcombe becomes general manager of the new optical systems division. Until recently he was manager of production improvement for ICL's product development group. Harry Roper, previously assistant chief of general staff (operational requirements) at the Ministry of Defence, becomes manager of military and public sector marketing with STC.

BCS Nottingham Business Game

THE East Midlands Business Game organised by the Nottingham branch of the BCS was won by the team from John Player and Sons.

Dennis Ellery, former assistant director and head of operational services with Kingsley Smith, has become a senior consultant with Triad Computing Systems.

Fisher Gumbrecht

Alex Gumbrecht, formerly European marketing manager of Datum, has been appointed sales director of Baydel.

Bernard Fisher becomes corporate vice-president for OEM products with Data 100 in the US. Previously he was managing director of Data 100 in the UK.

Scottish schools' computing contest

THE Interdata Trophy presented by Perkin-Elmer Data Systems has been won by a team from Eastwood High School, Glasgow.

The trophy is awarded for the winners of the Jordanhill, Glasgow, College of Education Schools' Computing Competition.

The competition is an annual event open to sixth year pupils studying for the Certificate of Sixth Year Studies in Mathematics, Numerical Analysis and Computer Programming.

Four problems had to be solved by writing programs using Interdata Fortran V.

Tony Wood-Smith, press relations manager for Honeywell's computer network information systems interests, has been appointed public relations director in succession to John Aeberhard who has transferred to the US.

David Wallis of Gould Computer Systems has been promoted from project manager, payroll systems to director responsible for the mainframe division.

● DIARY is on page 13

Silent terminal wins £2m TSB order for Philips

THE compact design and silent operation of the Philips PTS 6000 financial terminal system helped the company to win a £2 million contract to provide online and real time banking at 107 branches of the Scottish consortium of Trustee Savings Banks according to John Lowry of the Scottish TSB steering committee (CW, April 27).

The order involves terminals for 500 teller positions, and 112 Philips P800 series minicomputers.

The minis are built in France and the terminals in Sweden.

The PTS 6000 systems will be installed in banks in the Glasgow, Edinburgh and Dundee areas, and will be linked in real time to the Burroughs B3800 mainframe installed at a new computer centre in Glasgow.

The consortium includes three of Scotland's four TSB groups. The fourth group, in the Aberdeen area, has not yet decided whether to join the consortium, and at present has no computer.

Special software for the system has been specified jointly by the banks and Philips, and will be written by Philips programmers in the UK.

The banks will be looking at the feasibility of installing cash dispensers. Philips markets the Chubb cash dispenser worldwide as a unit in the PTS 6000 line.

A terminal specially designed for the UK banking environment around the 8080 micro sourced from Signetics is now offered as part of the range, but is not included in the Scottish order.

Philips now has 26 customers for PTS 6000 equipment in the UK, mainly local authorities.

● THE picture (right) shows Philips PTS 6000 terminals being used for data entry in a banking environment. The installation is at a Stockholm branch of one of Philips' biggest customers for the PTS 6000, the Svenska Handelsbanken.

Local authority to share county council power

A LIKELY new recruit to the growing number of local authorities sharing computer processing power is the Cotswold District Council, which this week held a meeting to ratify a recommendation that it should link into Gloucestershire County Council's new computer, to be installed by 1980.

Already the remaining five districts in Gloucestershire have agreed to link in to the proposed system, a Honeywell Level 66, at that time.

Since 1974, Cotswold District Council has been "going it alone" with a Honeywell 20/20 system.

Tony Sketchley, the council's finance director, explained: "It was not possible for Gloucestershire to accommodate us on its ICL 1904S machine back in 1974, because of the work that would have been needed — something like 300,000 rates entries a year.

Gloucestershire County Council announced the proposed switch from ICL to Honeywell earlier this year (CW, January 19).

The recommendation to link up with Gloucestershire was made by Sketchley, and one of the major advantages, he says, will be cost savings.

Overloaded system

WILTSHIRE County Council, already an old hand at running its own IBM 370/145 system, installed in 1973, is to spend £50,000 over the next two years on enhancing the system, before replacing it, possibly with an IBM 3031.

"Because we are taking on more applications, it is getting to the stage where the system is overloaded," said a council spokesman, "so we are planning to extend the memory by 512K. This will be supplied by Telex Computer Products."

Applications now run on the IBM 370/145 include payroll and general accounting, crime and accident statistics, housing rents, and property information processing.

Cost of the 3031 has been estimated at £800,000.

News of the enhancement and eventual 3031 purchase will come as a relief to Thamesdown Council, which now shares the IBM 370/145 facilities. At a meeting of the policy and resources committee, James Shaw, director of management services, told councillors that, without immediate action, Thamesdown would soon have an unsatisfactory computer service.

More calls for tax incentives

FOLLOWING the call by Sir Keith Joseph for lower taxes to stimulate innovation and technology-based industry, quoted in his Computer Weekly interview last week, both the Confederation of British Industry and ADAPSO, the American equivalent of the Computing Services Association, have urged their respective governments to encourage growth by tax incentives.

The CBI says in a letter to the Chancellor of the Exchequer, "As you have recognised, the acquisition of skills and incentives and the acceptance of greater responsibility need to be made much more attractive. Yet by giving much smaller benefits proportionately to the skilled than to the unskilled your budget proposals will do exactly the opposite."

The CBI calls for a cut of 2p in the basic rate of tax and adjustments in the higher rates, to encourage managers and skilled workers.

ADAPSO, the Association of Data Processing Service Organisations, has issued a statement recommending that tax incentives be introduced to encourage the investment of venture capital in new technology, to boost the economy. It says that "tax incentives have been sharply curtailed over the past ten years and now are no longer adequate to attract sufficient investment in high technology firms."

ADAPSO wants new legislation that will encourage the owners of technology to find buyers for it, encourage entrepreneurs to find new technology, and stimulate investment in R&D.

REPORTS FROM HANOVER FAIR BY KEITH JONES AND MARTIN BANKS

Suppliers seeking outlets in the UK

SYSTEMS suppliers at the Hanover Fair that told Computer Weekly they were seeking distributors for their products in the UK included the Stuttgart based systems house, David Datentechnik and the US based firm, Logical Machine Corp.

Both David Datentechnik, known as DDC, and Logical Machine Corp, known as Lomac, already sell directly or through distributors in most of Western Europe.

About 150 Adam systems have been sold in Europe to date and Lomac is setting up a directly owned German subsidiary based at Düsseldorf and a French subsidiary based in Paris.

Lomac's product plans include a smaller version of Adam called Tina.

The Stuttgart firm, DDC, which is aiming for a turnover of DM60 million this year, manufactures a family of three interactive screen based systems, the DDC System 110, 220 and 440. The 110 is configured around a Motorola 6800 microprocessor and uses floppy disc storage, while the top end 440 machine comes with a Data General Nova 2 processor with up to 280 Megabytes on disc and up to 20 display terminals.

The 220, launched at Hanover, fits between the 110 and 440 in performance and is configured around DDC's own Nova compatible 16-bit processor made up of four 4-bit slices.

A VISITOR to Hanover Fair was the Duke of Kent who made a whistle-stop tour of the seven UK exhibits supported by the British Overseas Trade Board. He talked to firms on the joint stand sponsored by BOTB and the Business Equipment Trade Association, including Data Recording Equipment, the newly formed subsidiary of Data Recording Instruments.

The Duke, who is vice chairman of BOTB, is seen here discussing the DRE 3300 fixed disc drive with Ulrich Virkus, sales manager of DRE's German subsidiary, based in Munich.

Exports accounted for 50% of the £18 million turnover chalked up by DRE in its 77/78 financial year which ended on March 31.

European launch for 2200VS

WANG used the Fair as the launch pad in Europe for its 2200VS virtual memory minicomputer system, first introduced in the US last year (CW, October 20, 1977).

It is available in two main configurations: the WCS60 which can handle up to 16 terminals, and the WCS80 which can handle up to 23 terminals. The main memory for each is a minimum of 64K bytes, expandable up to 256K bytes in 64K increments, and a total of 2,300M bytes of disc storage can be used. Prices for the system vary from $47,000 to $300,000.

A focal point for microsystems

THIS year's Hanover Fair turned into something of a European focal point for the microelectronics industry, with several manufacturers choosing it to launch new products.

Toshiba demonstrated its T400 personal computer system. It is not yet on sale, not even in Japan, and the two examples on the company's stand were both prototypes.

Aimed primarily at a similar market to such equipment as the Apple II, the T400 comes with between 8K and 16K bytes of ROM, in which a Monitor and Basic software reside. The minimum 4K bytes of RAM can be expanded up to 48K bytes, to cope with colour graphics work.

Two versions of graphics are available, offering either a standard resolution of 63 by 40 or a high resolution of 256 by 160. Both have 16 selectable colours.

The T400 hardware package includes cassette interfaces of both 1,200 baud and the Kansas City 300 baud standard, plus the option of a dot printer, floppy discs and an S-100 bus interface board.

Toshiba's agents in UK, International Office Products of Sunbury on Thames plan to market the system in about six months. No price has yet been settled, but Toshiba has quoted a US price of about $1,000.

A small London company, Albol Electronics and Mechanical Products, showed a small business system based on the Motorola 6800.

Known as Superclerk, the system is intended to fill the need for what Albol calls "a modern filing system." By using a Burroughs plasma panel display, rather than a video terminal, the system provides a "docket" sized page format, aimed at stock control and production control application.

Superclerk costs £7,800, including operating software that controls the formatting of pages and their storage and recall from floppy disc. A total of 1,008 pages can be stored on each disc.

The new joint venture company formed by AMD and Siemens, Advanced Micro Computers, got its first exhibition airing since its formation. On show were two new single board computer systems that are among the first products to carry the AMC banner.

The first is the SKC 85 which is based on the Siemens version of the Intel 8085 processor, and comes complete with between 2K and 4K bytes of ROM and 512 bytes of RAM. It uses a standard Eurocard board.

Eurocards are also used for the SMP 80 range of boards. The main item is a CPU board incorporating the Siemens 8080 device, and the range includes RAM and ROM/EPROM expansion boards, together with serial I/O, parallel I/O Teletype interface and analogue I/O boards. These boards may be sold through AMC in the US, though they are on a Siemens bus structure.

National Semiconductor was also showing board systems at Hanover and introduced three additional single board computers into its BLC80 range. The additions, the 80/11, 80/12 and 80/14, are intended to plug a market gap between the 80/10 and the 80/20.

The 11, 12 and 14 variants add 1K, 2K or 4K of static RAM to the standard 80/10 system, respectively, while each is socketed for up to 8K bytes of EPROM in either 1K or 2K byte increments.

Intel showed its Series 2 version of the Intellec microcomputer system. While still based on the 8080 processor, three system configurations are now available, starting with the 24K to 32K byte microcomputer, designated the 210. Next in the range is the 221, which adds to the microcomputer a 2000Z series terminal and a single floppy disc drive. The final variant is the 231, which adds a dual disc system capable of running both PLM 80 and Fortran 80 software.

Getting its first exhibition showing in Europe at Hanover Fair was the T400 personal computer system from Toshiba. It is scheduled to appear in the UK in about six months.

DIARY

MAY 4
Software engineering seminars — program structuring. J. E. Nicholls. Oxford University, Nuclear Physics Lecture Theatre, Keble Road, Oxford. 16.30. Details Dr J. S. Harris, 0865 56911.

MAY 8
Local computing from a regional bureau. BCS Medical London Group ICL, Euston Road, London NW1. 18.00.

AGM/Talk. D. Firnberg BCS East Anglia branch. Anchor Hotel, Thetford. 19.00.

MAY 9
How's it done on your site? — user case studies/AGM. BCS Operations Group. Polytechnic of Central London, 35 Marylebone Road, London NW1. 18.00.

AGM. BCS Kent branch. St George Hotel, Chatham. 19.30.

How to choose it. William Jacot. BCS New or Potential Users' Group. Royal Angus Hotel, Birmingham. 14.00.

AGM. BCS Newcastle-upon-Tyne branch. Barras Bridge Bldg. Newcastle University. 19.00.

MAY 9-11
Eurocomp 78. Online. Conference Centre, Wembley.

MAY 10
The design of advertising brochures. Steve Shephard, Tony Trives. Association of Independent Computer Specialists. National Liberal Club, London SW1. 18.30.

The work of the SSRC computing committee. Alastair Chalmers. BCS Survey Analysis Group. Polytechnic of North London, London N7. 17.30.

AGM. BCS Specialist Group for the Disabled. ICL, Euston Road, London NW1. 18.30.

AGM/What can computer technology offer developing countries? BCS Kingston branch/Group for Developing Countries. Regional Management Centre, New Malden. 19.00.

AGM. BCS, North Staffs branch. Crown Hotel, Stone. 20.00.

AGM/Performance measurement. P. Samet. BCS Teesside branch. Teesside Polytechnic, Middlesbrough. 19.00.

AGM. BCS Edinburgh branch, Mountbatten Bldg, Heriot-Watt University, Edinburgh. 18.00.

MAY 11
Bionic Man, fact or fiction? Institution of Electrical and Electronics Technician Engineers. Grand Hotel, Hanley, Stoke-on-Trent. 19.15.

Software engineering seminars — correctness concerns. J. E. Stoy. Oxford University, Nuclear Physics Lecture Theatre, Keble Road, Oxford. 16.30.

MAY 11-12
Programming Group meeting. IBM Computer Users' Association. Royal Angus Hotel, Birmingham.

MAY 12
Open Day. CMC Users' Association (CUMAC). CMC Ltd, Hemel Hempstead (Herts). 10.30. Details: Maidenhead 29525.

OP SPOT

By Bernard Allen

What kind of union for ops?

FOR several weeks now, operators from many sites have contacted me to discuss union membership.

Many feel that they need to belong to an organisation which will protect their interests, and I know of at least three installations where the operations staff are looking at various unions and considering what each has to offer.

The trend now seems to be swaying away from the concept of "an operators' union" and towards joining more established organisations.

This coincides with the advice given by union officials I have spoken to, who feel that an "operators' union" would not be strong enough to offer its members security and protection (Op Spot, March 2).

On that occasion, Ian Benson of Tass welcomed the fact that operators are becoming aware of the need to protect their interests, but said they should join a strong, established union and take an active role.

"I can understand their reacting in this way, but the problem is, they are unlikely to have sufficient numbers in terms of strength.

"In 1974 computer staff in Tass established local committees in London, Scotland and the Midlands and they are coordinated by a national committee. That is what I would advise staff to do if they feel they are not getting a fair deal. They should go to the local branch of their union and put a resolution for an advisory committee to be set up."

According to Roy Granthom of Apex, "It is good that operations staff are thinking about getting organised, but they should consider joining a union like ours because we have been established for a long time and have finance and experience."

These opinions contrast with those expressed by operations staff when we had a phone-in on the image of operations (Op Spot, February). Most seemed to feel operators should have their own union.

One said, "The only way operators will achieve any sort of recognition and make DPMs sit up and take notice is by setting up a national association or union, to control the standards concerning training, basic pay, shift allowance and job description."

It is evident that established unions have much to offer operations staff. They have considerable expertise in industrial matters and are extremely strong in terms of numbers and financial backing.

But they are unable to appreciate problems peculiar to the computer room, and operators complain of a void in the same areas time and time again.

The GEC operators' claim has highlighted several vital issues which apply to many installations. John Hardie, a shift supervisor at the company's Stoke, Coventry site, where he is also the operators' union representative, pointed out a number of problems faced by the staff (Op Spot, March 30).

John Hardie

Firstly, Hardie claimed that additions to the systems software called for greater technical awareness from the operators and increased their job responsibility.

Secondly, he said that the increased workload not only created extra console work, but also caused more paper handling, tape mounting and other ancillary work.

The situation of operators in general is made worse by the fact that at many sites they are not consulted about additions to the systems hardware. They are then expected to use the equipment as a normal part of their work. Also, it is clear that there is often no description of operators' duties.

Surely a properly organised operators' union or association could do much in establishing certain standards in these matters.

Expanding Opcomm gets into leisure activities

TO cater for the growing interest in the Opcomm operations group a team of regional coordinators is to be set up. The first of these, Pete Lomas, who recently took up employment in Birmingham, is to arrange a series of meetings in that area.

At a meeting of Opcomm at the Lanchester Poly in Coventry newly appointed social secretary Pete Brimble was given the go-ahead to arrange a large social meeting for Coventry operations staff and friends.

He said: "As an operations organisation, I feel we could fill the void in operators' sports and social life due to working shifts. Apart from the social function, I think we should go on to organise an indoor league specifically for local operations staff."

On the group's operator training project, a progress report was given by John McGinn, head of the working party carrying out the initial study on the matter.

Presenting a document on the subject he said, "The responsibilities of an organisation such as this should include the provision of training opportunities for operator of all degrees of ability. We have now produced a program for this."

He also suggested that a pool of "teacher operators" be set up to provide a body of knowledge to be used at established as well as new installations.

HINT OF THE WEEK

Page numbers also help

THE hint from Ron Linton relating to the listing of the George 2 Macrofile (Op Spot, April 6) has prompted a number of readers to write on the topic.

This week's hint on the subject comes from Derek Hewer, a senior operator with McCorquodale Books, in Colchester. He writes:

"I noticed Ron Linton did not mention that you can use the slash (/) to put page or line numbers with the macro index names. This can be very useful when dealing with a large macro library."

In his example he uses the macro names given by Ron Linton:

```
0001 XPCK/"""""        PAGE 1"""""
0002 ALGOL/"""""       PAGE 2 """"
0003 XPJC/"""""        PAGE 3"""""
0004 ACCOUNTS/"""""    PAGE 4"""""
0005 END
0006 MACDEF XPCK/"""""  XPCK-1 """"
—
—
—
0200 MACDEF    ACCOUNTS/"""""   ACCOUNTS"""""
```

Keeping track of all the price, currency exchange and discount details in sugar broking can be a tricky business — one that sugar merchant A. S. Pigott and Son has answered by installing a Data General Nova 3 minicomputer. This replaces a Mitsubishi Melcrom VRC system and features 64K of main memory, a 10 Mbyte disc drive, five VDUs, and a line printer. Among its main applications are client credit limit and sugar stock level and price checks. Our picture shows A. S. Pigott (right) and Geoffrey Pigott, the managing director.

45,000 at work on computers

A TOTAL of 35,000 people were employed in the manufacture of computers in England and Wales, and 6,300 in Scotland, in June, 1976, the Employment Under-Secretary, John Golding, told the Commons.

Replying to Gordon Wilson (Scot Nat), Golding said that more up-to-date provisional estimates for Britain as a whole showed that the industry employed a total of 45,200 people in February, 1978.

Eurocomp78

Congress theme to be Information Dynamics

RORY JOHNSTON LOOKS AT THE PROGRAMME FOR THE EUROPEAN COMPUTING CONGRESS TO BE HELD AT WEMBLEY NEXT WEEK — AND AT SOME OF THE PERSONALITIES INVOLVED . . . .

THE theme of this year's European Computing Congress will be Information Dynamics, which is described as "the product of computer and communications technologies".

In addition to discussing the technical aspects of networks, distributed information systems, and databases, the Congress will spend considerable time dealing with the social and business impacts of Information Dynamics, user issues, regulations, and national computer policy.

Eurocomp 78, as it is called, will be held at Wembley Conference Centre from May 9 to 11. In addition to the conference, there will be an exhibition with 40 companies taking part. Among these will be Univac, GEC, Tektronix, and the UK Post Office.

There will also be presentations by a range of firms in one of the lecture theatres.

A sizeable number of well-known names in the computer field are in the programme as speakers and session chairmen. Christopher Layton, director of science and technology at the EEC, will chair an international user forum, the conference session on the Social Impact of Information Dynamics will be led by Chris Evans of the National Physical Laboratory, and a discussion on Computing Policy in the UK will include Reay Atkinson, director of the CCA, Martin Lam of the DoI, and the outspoken Gerry Fisher, former president of the BCS.

The conference will consist of formal sessions for the presentation of papers, some discussion sessions, and six Review Briefings, which will give an overview of some specific topics that are thought to be of critical interest to designers and users of information systems.

Topics for the Review Briefings are: Distributed Systems, chaired by David Hebditch, of Expertise International; Networks, chaired by Roger Scantlebury of Logica; Telecommunications, chaired by David Bayliss of Pactel; Word Processing, chaired by Sandy Douglas of LSE and the BCS WP working group; Regulation of International Data Flow, chaired by Russell Pipe, consultant to OECD; and Publicly Available Information Services (Prestel, Ceefax, and Oracle) chaired by consultant David Butler.

There will be up to three conference sessions running at once, with the Review Briefings making a fourth stream, one briefing each morning and afternoon for the three days. The conference sessions will also take up a morning or afternoon, with some shorter sessions and discussions in the early evenings.

The later part of the first evening will consist of a congress reception, and on the second evening, industry receptions.

Attendance at the conference will cost £195, including a copy of the proceedings, and lunches and other refreshments. A single Review Briefing, however, can be attended for £55, which includes the Review Briefing notes and refreshments for one day. The exhibition costs £2 at the door, but free tickets can be obtained from Online, Cleveland Road, Uxbridge UB8 2DD, which will also provide all other registration information.

Among the other topics of the conference sessions will be: The Data Communications User Viewpoint, presented by Inforep of France; Personnel Issues of Information Dynamics; sessions on general aspects and case studies of Distributed and Dispersed Systems; User/Terminal Interfaces; New Telecommunications Techniques, chaired by Martyn Roetter of Arthur D. Little; and Interfaces and Protocols.

There will be sessions on network design, control, monitoring, and interconnection of networks, and plans for networks from the viewpoints of users and of PTTs.

Other open discussion meetings will cover Computer Systems in the Year 2000, and the implications to users of tariffs.

There will also be opportunity for delegates to set up discussions on topics of their own choosing at the time.

CHRISTOPHER LAYTON, director of science and technology at the EEC . . . to chair an international user forum.

DAVID BUTLER, a consultant . . . to chair a review briefing on publicly available information services.

GERRY FISHER, former president of the BCS . . . to discuss computing policy in the UK.

Philips takes 80% stake in Canadian word processing firm

DUTCH giant Philips has taken a major stride in the competitive word processing market with the acquisition of about 80% of the Montreal-based company Micom.

Micom was set up by Steve Dorsey, former head of another word processing company, ABS, which ran into financial difficulties and was rescued by a number of interests including the Canadian government.

Built around the 8080 micro, the stand-alone Micom product has been so successful in North America, that Philips intends to retain the Micom name for the floppy-disc-backed system there.

A UK agent is said to have taken orders for 95 systems, although none has yet been delivered.

In Europe, the Micom product will be launched as a complement to the Philips WP 5001 once it has been given a Philips house identity.

The machine will be housed in a Philips cabinet, fitted with Philips displays and an improved keyboard, and adapted so that the software meets European requirements. Among the attractive software options on the Micom system are a background arithmetic package which makes it possible to use it for all the standard business applications like accounting and billing.

Latest figures for sales available are for 1976, when 300 Micom systems were sold. Philips' confidence in the company is underlined by its plan to quadruple the factory space in Montreal.

Philips' own product for the stand-alone word processor market is the magnetic card-based WP 5001, which is built around the Zilog Z80 microprocessor.

Since its launch last year, the WP 5001, which sells for a standard £7,850, has made significant inroads into the UK market.

Tim Palmer previews Compec Europe, to be held in Brussels next week

Industry's leading continental show for the systems builder

AFTER a tentative start two years ago, consolidated by a highly successful event in 1977, Compec Europe, which is sponsored by Computer Weekly, has become the industry's premier continental show for the systems builder.

Equipment from more than 100 manufacturers will be on display on some 80 stands at the Centre International Rogier in Brussels for three days, and the only problem for the diligent visitor will be finding time to examine everything on show.

Brussels, home of the European ideal, opens its doors to Compec on May 9, and the exhibition will provide a showcase for the cream of Europe's hardware manufacturers, as well as all the major US minicomputer and OEM equipment suppliers.

Leading European minimakers showing their latest offerings include SEMS of France, Ferranti of the UK, and Norsk Data of Norway.

SEMS will put the spotlight on the Solar 16/40 mini in a real-time environment.

Ferranti will demonstrate the power of the Argus 700 mini computer in an industrial and process control enviconment by running the Progress Management System software package.

Norsk Data will emphasise the scientific applications handled by the high-technology Norsk-10/S minicomputer which made its debut last year.

On the business front, Business Computers (Systems) Ltd of the UK will show its new Molecular Series IV processor. The company's earlier systems have found favour in France and Belgium, and BC(S)L will be seeking to extend its coverage.

The US minimakers are out in force. Industry leader Digital Equipment will address both ends of the market, offering its powerful low-cost top-end machine, the PDP-11/60, alongside the LSI-11/2 microcomputer on a board for the cost-conscious sytem builder.

General Automation is a late but enthusiastic entrant to the business systems market with its DS-440 hardware-software package, and Harris will underline the virtues of the System 125 virtual memory computer system which runs under the multi-task multi-function Vulcan operating system.

With up to one Megaword of 350 nanosecond memory using 16K-bit chips, the new 2113A model processor in the HP-1000 family is understandably causing excitement at Hewlett-Packard, which claims that it is the fastest 16-bit mini in the business.

Modcomp also has a new entrant in the high-performance minicomputer stakes, the Classic 7860. Six programming languages and the Total database management system make the Classic an attractive proposition for those requiring versatility as well as power and performance.

Perkin-Elmer Data Systems is the home of Interdata, which will be showing selections from its 16 and 32-bit mini lines, while Systems Engineering Laboratories, SEL, specialises in 32-bit machine for simulation and other demanding scientific applications.

The new Texas Instruments package for the business system builder will get one of its first European outings at Compec Europe. Called the DS990 and configured around the TI-990 mini, the product marks TI's first major entry into the business market on its own account.

There can hardly be a stand at Compec not showing at least one piece of equipment incorporating a microprocessor and a wide range of overtly micro systems will be on show.

CMC Benelux will offer Europeans a first view of the new Sycor 445 terminal cluster, built around the Intel 8085 micro.

The MITS range of microcomputer systems will be on show at SA Fimeca NV.

Hawker Siddeley Dynamics is a name which the computer industry is certain to get to know in the future as the parent company diverts some of the cash it received from aircraft nationalisation into advanced technology. The company's offering at Compec is the Sequel microprocessor-based modular control and supervisory system.

Haywood Electronics will offer microcomputers based on the 8085, together with peripherals for the micro systems builder.

Intel is to display its new Intellec Series II microprocessor development system which includes resident assemblers for the 8048, 8080 and 8085.

Intel's strongest rival, Zilog finds a home for its Z80 micro on the Heligraph stand.

Incaa will offer the Capro-i microcomputer which is based on the Motorola 6800 and runs under a multitasking executive floppy-disc operating system.

Plenty for the micro systems builder will be found on the Rodeico stand, where items from Fairchild including the F8, the 9440 Microflame and the 6800 family will be exhibited.

Trivector Systems has done some clever engineering to assemble a powerful microcomputer system around three Z80A devices under the name Triton 3. The system has already found favour with a UK business computer company, and Trivector will be seeking similar business on the continent.

Vector International will feature standard Eurocards, modules for the micro systems builder which are based on the Intel 8085. It also has an intriguing Unique Concept Terminal, again designed to use the 8085, and aimed at a range of applications which includes analogue data logging and monitoring, stand-alone cash-register and point-of-sale terminal.

Such a brief tour of the mini and micro companies can give only a flavour of the enormous range of equipment which will be on offer. A glance at the classified section of the official catalogue reveals that every specialist sector of the industry will be amply represented.

Printers will be found on the Cifer, CMC, Data 100, DEC, Gamma, Logabax, Rochford Thompson, Transdata, Trend and Trivector stands.

VDUs will feature at Billing Machines, Cifer, Datacare, DEC, Ferranti Cetec Graphics, Haywood Electronics, Lynwood Scientific, Regulation Mesure, Tektronix and Terminal Display Systems stands.

People looking for discs and drives, tape units and floppy drives will find that Penny & Giles, Heliagraph, Eurodia, MCR, Samson Computer Supplies and Norman Magnetics are among the companies ready to meet their requirements.

There will be plenty to attract the attention of the data communication specialist, and one stand which should not be missed is that of Modular Technology, the minimodem company.

The Tektronix 4025 was launched in January, and Compec Europe will be one of its first public showings. Its powerful graphics and alphanumeric are fully integrated and can be relied and scrolled together. Easy-graphic software and a full range of peripherals are available.

Package trips for CW

TWO low-cost package trips to Compec Europe have been arranged for Computer Weekly readers.

Tour A covers five nights, leaving London Heathrow at 17.40 on May 7 and returning at 16.40 on May 12 from Brussels at a cost of £171 or £199, depending on the hotel chosen.

Tour B is for two nights at a cost of £112 or £139, leaving at 09.25 on May 9 and returning at 18.25 on May 11.

For further details contact Commercial Trade Travel Ltd, Carlisle House, 8 Southampton Row, London WC1, Telephone 01-405 5469. Telex 21792/949.

Hardware/software packages launched by TI and Interdata

A FAMILY of three disc-based systems for commercial users called the DS 990 models 4, 6 and 8 has been announced by Texas Instruments, while Interdata has introduced two hardware/software packages for program development called the Pack 160 and 320.

The DS990 systems are all based on the TI 990/10 processor and run an enhanced version of the DX10 operating system. This provides file management features like multi-key indexed file support and can handle batch processing and multi-terminal interactive applications. Languages available with the DS 990 systems include Cobol, Basic and Business Basic.

All three models come with a 128K byte main memory and one 1,920 character video terminal in their basic forms, but they differ in the amount of disc store provided.

The Model 4 has a 10 Megabyte cartridge drive, the Model 6 has two 25 Megabyte drives and the Model 8 comes with two 50 Megabyte units. The prices of the basic models range from £19,000 to £30,000.

The main memory size of each of the DS 990 systems can be expanded to 2,048K bytes and more VDUs and a variety of peripherals can be added.

The Pack 160 and 320 systems from Interdata both come with Extended Fortran IV, a 10 Megabyte disc drive and one Model 1110 VDU. The 160 is based on an Interdata Model 8/16E processor with a 64K byte main memory and costs £17,610, while the 320 comes with the more powerful Model 7/32 processor and costs £26,340 with 192K bytes of memory. The main memories on the 160 and 320 can be expanded to 256K bytes and one Megabyte, respectively.

A multi-terminal development subsystem for concurrent online program development using four additional VDUs can be supplied with the 320 for an extra £9,380, including an extra 64K bytes of memory.

Remote program development terminals can be supported with Ilam, Interdata Telecommunications Access Method. This costs £3,000, including data handling hardware and a data set adapter, and also facilitates communications with another 320 or with a remote host mainframe using binary synchronous protocol.

Courses in structured programming

A NEW company has been set up by Infotech to provide courses in structured methods of programming and system design. Infotech Methods Ltd (IML) will offer training based on Michael Jackson's ideas.

Infotech previously worked in close conjunction with Michael Jackson and ran courses in the design methods evolved by him. The two organisations parted company last June and are now completely independent.

According to IML, its programming technology represents a development and refinement of Jackson's ideas.

Infotech's methods will be known as IPT. Infotech Programming Technology.

LETTERS TO THE EDITOR

Access control and 'inside jobs'

IN reply to your correspondent's letter commenting on the Computer Environment supplement (Letters, April 13), I am sorry that my contribution did not make sufficiently clear to him the connection between access control and "inside jobs".

It is simply that access control can be organised so that just because a person is accorded free access to one part of a computer site, he is not thereby automatically entitled to have free run of all other parts of that site or, very importantly, of any separately located computer sites, media storage areas, terminals etc.

With such an access control system, "inside jobs" will be more likely to demand collusion between different categories of staff. And the wider the need for collusion, the more difficult and risky the crime, and the less opportunity or temptation there is to perpetrate it.

Of course, stratified control of access is clearly intolerable unless it works automatically, and this is why I advocate the use of "hands free" electronic access control systems for such situations.

My article was designed to show the computer user how — rather than whether — to assess an access control problem, with particular emphasis on the need for a system approach. No scares were mongered!

I am heartened that your correspondent recommends that "the appropriate level of physical security" should be employed in data processing departments, and that this should be determined by risk assessment, including calculation of the cost of recreating data etc, though I could add other criteria to his list.

When it is considered that the cost of even a stupendously elaborate hands-free access control would provide efficient and unobtrusive protection for the installation for year after year, it is difficult to see how there could be any cost justification for even the most modest computer installation to do without some sort of access control system. Protection should be considered not only from fraud, but also from damage (be it wilful or blundering) or even (as occurred in Lancashire recently) a "sit-in".

NEVILL PORTER
Mastiff Security Systems
Leatherhead, Surrey

The Editor welcomes letters on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. All letters are liable to be cut at the discretion of the Editor, unless correspondents state that their letters may not be cut.

Doctor's feat

YOU report that two analyst/programmers have performed the seemingly impossible feat of getting their PhDs while working full-time (CW, April 13).

May I respectfully inform you that I performed a similar feat in 1972 submitting my thesis entitled "Binary Dual Arithmetic" to London University as an external student while working full-time.

My thesis develops the theory of a logarithmic type of arithmetic including numbers which I have called "natural computer logarithms".

ROY S. MULLINS
BSc, PhD, MBCS
London

Director of the government's Threshold Scheme, GEORGE PENNEY, was recently invited to address a group of operations managers and found that there were three problems uppermost in their minds on the question of selecting trainee operators. Foremost was where to find suitable candidates; then, having found them, how to retain them for more than six months; and finally how to offer any career path to those who do stay longer.

Here he sets out his answers to those problems.

How to find an operator— and keep him

HAVING been invited, recently, to address a group of computer operations managers on the problem of selecting trainee operators, I was a little surprised to learn that there were three problems uppermost in their minds, of which selection was not one.

Their most daunting problem, I learnt, was where to find suitable candidates; after that there were the two problems: how to retain an operator for more than six months; and how to offer any career path to those who do stay longer.

The conventional wisdom is that someone without five "O" levels is not worth considering as a computer operator.

All they were looking for, in addition, was: verbal ability, intelligence, communication ability, self-discipline, common sense, responsibility, reliability, quick response, good memory, enthusiasm, leadership, agility and dexterity, good health, and ability to work in a team.

When I asked which of these qualities was essential and which only desirable, I was assured that they are all essential. And for what? "Well," they admitted, "it's mainly button pushing until they reach shift leader." And is that what is supposed to fill them with enthusiasm and exercise their intelligence, communication ability etc?

Perhaps, after all, selection is the real problem. Should one, for instance, demand "O" levels? Or should the search even be confined to school-leavers?

A given standard of general intelligence is necessary to obtain "O" levels and a given standard of general intelligence is needed to perform successfully as a computer operator. Are these two the same? And does the absence of "O" levels indicate the lack of that level of intelligence? I don't think anyone knows the answer to the first; as to the second, there are many schools, and streams within others, where no "O" level syllabus is offered.

Some pupils, for one reason or another, either fail examinations or leave without taking them. Yet, through the Threshold Scheme, we have been successful in training and placing young people who fall within these categories.

School-leavers look for a career, but what are the possible careers for a trainee computer operator?

Penney . . . for the large majority it is button-pushing or get out.

In theory, there is a stepped route up to DP manager, but in practice, with the levelling out of salaries between operators and programmers, and with shift allowances for operators, the first sideways move from operations into programming has to be made within the first six months, if a drop in salary is not to result. It is only a limited minority which gets the opportunity of making that move.

Another minority will find promotion through operating, or become, for instance, operating system specialists; but for the large majority, it is button-pushing or get out.

The first thing to do, for this job as for any other is to set down the duties and responsibilities, to produce a job specification. Also, if this is the first step to several possible careers, the main duties and responsibilities of, at least, the next step up the ladder should also be specified as desirable, though not, perhaps, essential.

Next, based on this specification, produce a personnel specification. This includes essential and desirable mental and physical qualities, personal attributes, knowledge, experience and education, and any special features of the job, such as shift work or mobility.

Great care has to be taken, particularly when applicants are in short supply, not to overspecify.

A lot can be learnt from an interview, by following up clues which should appear on any properly completed, and properly designed, application form.

There are many qualities, however, which can only be identified by some objective test. Probably the two most important of these, for a computer operator, are reasoning power or general intelligence, and attention to detail or clerical ability.

For each method of assessing potential — and this is what psychometric tests are doing — there is a cost. Many organisations set a "programming aptitude test" to candidates for operating, but use a lower cut-off score. The only cost involved is the time taken to set and mark the test.

However, there is no published evidence to show what mental characteristic any of the tests called by this name are in fact identifying; some are of the nature of general intelligence tests, but lacking any published norms, while some show no evidence of measuring anything at all.

At the other end of the scale there are standard psychometric tests, for which there are published norms. The limitation on their use — essential, if they are to remain valid measuring instruments — is that they may only be obtained, and administered, by suitably qualified people.

Another way is to use the services of trained people from another organisation. At NCC, we have a team of trained people, so that we can offer a service either at employers' premises or on NCC premises.

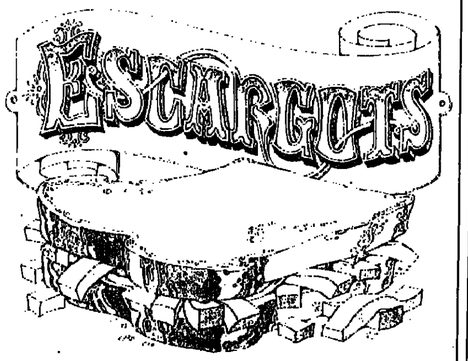
If there is a plentiful supply of candidates and you have ample career opportunities then specify whatever level of academic attainment you are prepared to pay for, but still use all the means at your disposal to find someone who will really fit your personnel specification. If you take on someone who does not fit, the process of getting rid of that one and finding another is likely to cost you several thousand pounds.

If candidates are in short supply, and if career opportunities are limited, consider seriously the two possibilities: using mature people who are not looking for a career, and applying objective tests which will enable you to explore a much wider range of candidates.

There is no one right answer for every installation and every location. I think that what is going wrong at present is that many managers imagine that there is.

Datasolve Datasolve Datasolve Datasolve

All sorts of contracts for all sorts of tastes



At Knight Computer Services, we know better than to offer a chip butty to an escargot freak. After all, we're well aware that most DP people have as individuals an idea of their perfect contract as they do of their favourite food. So we take the time and trouble to discuss people's individual preferences, and to make sure that every man or woman who comes to see us get the contract that's to their taste.

And while we're on the subject of exotic dishes, we should point out that we can just as easily offer you a contract in a part of the world where home cooking means Bauern Bratwurst or Osso Bucco, as in the more familar territories of Yorkshire pudding and jellied eels.

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IBM
IBM Data 100
IBM System 3 & 32 Ops.
IBM 370 DOS VS POWER VS Ops.
IBM 360/370 DOS GRASP Ops.

ICL
ICL 2903/4 Ops.
ICL 2960/VME/K Ops.
ICL 1900 G11, 11 + & 111 Ops.

OTHERS
Burroughs Small & Medium System Ops.
Honeywell Level 60 Ops.
JCL Writers GCOS
Univac 1100 & 9400 Ops.
Terminal Ops.
Various Contracts

For further details or advice on these and other U.K. and European Contracts still in the pipeline, call Sue Smyth, June Mogg or Jane Asbury NOW! on 01-491 4706 or 01-439 3411.

Programmer/Analysts

Immediate/Forthcoming Assignments

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SYS 3 EXP+COBOL – Brussels
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PDP11 MACRO11 – City
PDP11 RSX11/M – Italy

ICL
COBOL+G11 – Sussex/London
2900 COBOL+VME – Luxembourg
2900 Consultant – London.
PLAN+Driver+G11 – Herts.
FILETAB+G11 – Sussex
PLAN – London.

BURROUGHS
COBOL+MCP – Bristol/Brighton

Please contact Richard Kaluzynski or Sue Gillam on: 01-491 4706 or 01-439 3411.

Remember our phone number is 01-491 4706.

All vacancies are open to both male and female applicants.

Knight

Knight Computer Services Limited,
14 Old Park Lane, London W1Y 4NL
Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

Your number one contact for contracts

University College London

PROGRAMMER/ANALYSTS FOR LINKED COMPUTER SYSTEMS

Required by the Computer Centre to join project teams developing software for a new service based on several linked GEC 4082 computers. This will gradually replace the existing IBM 360/65 service and provide predominantly keyboard terminal access to a large number of staff and students.

PROJECT LEADER
with several years' experience in telecommunications and remote job entry software.

PROGRAMMER ANALYSTS
with experience and/or interest in any of the following areas

- Operating systems (for linked multi-mini computers)
- File systems and archiving
- Resource allocation and control
- Telecommunications and RJE
- Applications software and graphics

Candidates should possess a degree or have equivalent experience and salaries will be on one of the academic related scales £3214 to £6282, £3684 to £6178 or £5954 to £7308

Consideration may also be given to recruiting less qualified people on to the non-academic scales £2309 to £3932. An additional London Allowance of £450 is also paid.

Application enquiries should be sent to Computer Manager, University College London, 19 Gordon Street, London WC1 or telephone 01-387 0898.

THE OPEN UNIVERSITY IN SCOTLAND

MATHEMATICS STAFF TUTOR

Applications are invited for the post of Staff Tutor in Mathematics at the Open University in Scotland. The post is tenured and an appointment will be made at a suitable point on the lecturer scale £3660-£7308 p.a. Preference will be given to candidates with an interest in teaching statistics, computing or applied mathematics. The appointee will be based at the Edinburgh office of the Open University and should live within easy travelling distance of that city.

Further particulars and application forms are available, by postcard request please, from

The Personnel Manager (STSS), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL, or by telephone from Milton Keynes 63069 (24-hour answering service). Closing date for applications: 19th May, 1978.

APPLICATIONS PROGRAMMERS

London, SW1 / Croydon — Circa £6000

Several of our clients are looking for Programmers with Mini Computer experience. If you have used ASSEMBLER or BASIC for around 2 years we could find you a vacancy with a good career path with one of our clients

PROGRAMMERS

London / Home Counties — to £5500

A large number of vacancies for COBOL Programmers with experience from 1 year upwards over in small and large installations. Do you feel you have the potential to meet a challenge and a desire for a secure future? If so, please telephone us

SENIOR SYSTEMS ANALYST

Ruislip / Hayes / Greenford / Harrow — to £7000

With real-time and on-line experience. Applicants should have completed at least 1 project from feasibility to implementation. Should be able to communicate at all levels

PLEASE PHONE FOR FURTHER DETAILS AND AN APPLICATION FORM

AMES PERSONNEL
TELEPHONE: 01-767 0611

WESSEX
REGIONAL HEALTH AUTHORITY

Project Control Services Assistant

Salary £3153 p.a. rising to £4038 p.a. inclusive of supplements (G.A.A. Grade)

We are looking for someone to join an established team based at Winchester, developing and applying project control techniques, especially network analysis. The team provides a project planning and progress monitoring service for the Authority, particularly in the field of hospital design. The application of these techniques is also developing in other spheres of activity. The work will involve close liaison with Architects, Engineers and Planners, preparation of networks and the use of a computer to maintain them, and provides an excellent opportunity to gain experience in the use of project control techniques. The post will also give the successful applicant a valuable insight into the structure and operation of the NHS from which a number of career options could be developed.

An analytical and precise approach is essential as is the ability to communicate with staff at all levels and understand specialists from a variety of disciplines. Training will be provided, but relevant experience in one of the following would be an advantage
Building Design, Network Analysis, Computer Systems, Management Services and Construction Industry.

Further details and application forms from the Personnel Officer, Highcroft, Romsey Road, Winchester. Tel. (0962) 63811, ext. 360/471.
Closing date: 22nd May, 1978.

Software Programmers

with commercial systems experience — Surrey

Olivetti's success in establishing itself as Europe's leading small computer manufacturer has been built on a strategy of continuous new product introduction: designing and developing successively more advanced machines to anticipate new market needs.

This activity has led to an equally dynamic and commercial approach to software development, marketing and training. We now have two opportunities for experienced software or systems programmers who are interested in the commercial as well as the technical aspects of software support to develop their career in one of these directions:

Software Instructor — a key business role

You would be training our own professional software staff who play a vital sales support role in the field. The objective: to ensure that they always offer our customers the highest standards of expertise and the most up-to-date techniques available, especially when new machines are brought onto the market. Your personal responsibility will be to evaluate and contribute to the development of new software, to translate this into effective training programmes, and to run the courses with a high degree of personal initiative. We are offering a very flexible salary package for this post plus car allowance. Experience of training is not necessary.

Software Consultant — a problem-solving role

As one of our "In-house" software experts you will be the focus of all technical information exchanges between production centres, sales offices and software houses. You will also use your knowledge and expertise to assist in the development of new software, and will act as a general channel of technical information within the company, in the UK and Europe. Probably aged 22-30, you must have experience of commercial disk-based systems or VRCs. Salary package will be negotiated in the range £6-7,000 including a car allowance.

Both posts carry full large-company benefits including assistance with relocation to our Haslemere Training Centre.

Please write with brief details or phone for a personal history form to:
Jim Chester,
Regional Personnel Manager,
British Olivetti Limited,
30 Berkeley Square, London W1.
Telephone 01-629 8807.

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JBA

GRADUATES

WITH ANY TECHNICAL DEGREE

(Electronics, Maths, Physics, Computer Sciences, etc.)

HERTFORDSHIRE – Starting Salaries up to £4,000

The software development group of a major intelligent-terminal and mini-systems manufacturer now requires several graduates to join the current project, which offers an exciting range of diverse activities from pure creative development to the testing and implementation of software.
Ample and adequate training will be given, interspersed with "hands-on" practical work, making this an ideal opportunity to commence a career in the mini-computer areas of the industry, e.g. at the forefront of computing technology.
Candidates who have some experience of programming, particularly of a technical nature, would be preferred but the potential to progress and quickly become an effective team member is the overriding factor.

* GENEROUS RELOCATION PACKAGE * ENCOURAGEMENT AND HELP IN CAREER PROGRESSION
* MODERN WORKING ENVIRONMENT * PLEASANT FRIENDLY ATMOSPHERE

Contact: Mike Creamer,
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Tel: 01-491 4478

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Computer Personnel Consultants

DATABASE TRAINING

ANALYSTS and PROGRAMMERS

S.W. LONDON — To £7000

Our client is looking to the eighties when they will need experienced database personnel. They realise the best method of satisfying this requirement is to recruit NOW and train their staff in this specialised field.

As one of the market leaders in a highly technical industry, the company utilises the latest computer techniques and courses are given in appropriate areas. The department operates an extensive T.P. network and combines small with large IBM machines.

Programmers should have a minimum of 2 years' COBOL and salaries can be as high as £6000 per annum for the more senior applicants.

Analyst/Programmers can command £7000 per annum, and the junior positions will start circa £5000 per annum.

Promotion prospects are excellent and fringe benefits are comparable to other leading companies.

SYSTEMS & PROGRAMMING CONSULTANCY

PROGRAMMERS — To £6800
SYSTEMS ANALYSTS — To £7800

Join this dynamic systems house currently in a phase of controlled expansion. Opportunities to gain experience with a variety of machines and systems makes this an ideal move in the career path for programmers and analysts with 2-3 years' commercial D.P. experience.

If you would like to sample several different installations and receive a first-class training in professional systems consultancy, this Company offers attractive working conditions, with their own in-house computer, situated in a convenient location in London's West End.

PROGRAMMER/ANALYST

Basildon Area — To £5500 + relocation

We wish to recruit a Programmer/Analyst to work in a stimulating environment with a forward-looking Data Processing Department.

The successful applicants will take their place in a small, very active department where they will work on a variety of projects utilising IBM 370/158 under OS MVS.

Full training will be given as required and there are excellent opportunities to further develop analytical skills. Career prospects both immediately and in the long term are very good.

Applicants for the post should offer two years' IBM OS COBOL together with a knowledge of BOMP.

The salary stated above is a guideline, candidates offering considerably more than the basic requirement will be able to negotiate at a higher rate.

The company offer a comprehensive package of benefits which includes relocation as necessary

PROGRAMMERS to PROJECT LEADERS

BEDS/HERTS — £4000-£7000

A number of outstanding vacancies exist for programmers to project leaders to work on our client's new development projects.

There are vacancies at most levels ranging from Junior Programmers through to Analyst/Programmers and Senior Analysts with potential to move into project leading positions. All positions provide excellent opportunities for career progression and of gaining experience of advanced hardware and software products.

Programmers and Analyst/Programmers should offer from twelve months' experience of COBOL, PL/1 or Assembler. Analysts should offer sound commercial experience and need not have a programming background.

Starting salaries will be commensurate with experience and are additionally enhanced by a range of large company benefits.

24-hour answering service
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★ LEARN NEW LANGUAGES, NEW COMPUTERS
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CHIEF PROGRAMMER
HANTS

Our client is a major British company with business interests in many areas. Retaining IBM 370 158 and using mainly PL/I, they seek chief programmer with demonstrated programming exp. Co offers
★ Responsibility for program team
★ Wide range of projects
★ Secure future
★ Flexi hours. Annual Bonus
★ Salary to £7,000

Ref. 1436

JUNIOR PROGS
CITY/SE

A challenging career awaits you if you have experience on any IBM high level language to join a highly successful team within leading national organisation with IBM 370 hardware. Co. offers
★ Training in PL/I
★ Learn Database & T P.
★ Room for growth and promotion
★ Development of new projects
★ Salary £4,500

Ref. 1150

SNR ANALYST/PROG
ESSEX

Communications company working on a global scale seeks clear, logical thinking analyst programmer for their ICL 1900/2900 Series equipment. Co. can offer
★ Control of small development or support projects
★ Supervisory experience
★ Full scale of projects ranging from purchasing to financial modelling
★ Subsidised restaurant/sports and social club
★ Salary £5,500

Ref. 1153

BURROUGHS PROGRAMMERS
LONDON

Challenging opportunities exist for COBOL programmers at all levels for B3700 hardware. This well-established company has opportunities for programmers with initiative and drive for their installations in central London and Surrey. Co. offers
★ Excellent working environment
★ Excellent career opportunities
★ Opportunities to go on to minis
★ Flexi time, free restaurant and bonus
★ Salary to £5,000

Ref. 1387

IBM PROGRAMMERS
LONDON

Multi national company retaining large IBM 370 equipment requires programmers with at least 18 months' Assembler experience to join highly professional team. They are currently developing a major sophisticated on-line system Co. offers
★ Highly progressive organisation
★ Continued development with a well planned schedule
★ Good promotional prospects
★ Excellent benefits including cheap travel
★ Salary to £6,000

Ref. 1290

PL/I PROG
KENT

Why travel to London when opportunities like this exist? PL/I Programmers, this well-known national company with large IBM 370 equipment can offer you
★ Security in a very well-established and highly organised D.P. division
★ Training in IMS
★ Prospects for systems
★ Salary £4,800

Ref. 1216

HONEYWELL PROGS
LONDON

The success rate of this large manufacturing company has led to the need for additional analyst programmers. The right applicant will join a professional and enthusiastic team utilising Honeywell mainframe and preferably had OS 2000 experience. Co. offers.
★ Training in IMS BOMP
★ Opportunities for using MINIS in near future
★ Cheap Company Products
★ Plush modern offices
★ FREE restaurant/4 weeks' holiday
★ Salary to £6,000

Ref. 1412

NCR PROGRAMMERS
LONDON

Our client, an international company covering a large range of NCR mainframes and minis are seeking COBOL programmers at all levels. They are involved at present in a variety of commercial, financial and industrial projects. Co. offers
★ Training opportunities for IBM, ICL or UNIVAC COBOL progs.
★ Extensive training on new machines
★ Career development in systems
★ Excellent company benefits
★ Salary to £6,500

Ref. 1327

SENIOR PROGRAMMERS IBM
MIDDLESEX

Make a career move and join this progressive national company based in Middlesex. Due to continued expansion they are seeking senior programmers with initiative and ability to lead a strong team. They have openings for IBM COBOL or RPG II experience. Co offers
★ Training in CICS and DL/I
★ A chance to progress successfully in well-established division
★ Extremely interesting work
★ Promotion on merit
★ Good Company benefits
★ Salary to £7,000

Ref. 1431

IBM ANALYST/PROGRAMMERS
SURREY

Opportunities in a local area. Rapidly expanding company seeks COBOL analyst programmers. This large concern with large IBM equipment in a commercial and financial environment can offer
★ Excellent promotional prospects
★ A variety of new development work
★ Free BUPA and flexitime
★ Salary £6,000 (neg)

Ref. 1382

MINI PROGRAMMERS
LONDON

World wide organisation are recruiting people with any MINI ASSEMBLER experience for DEC PDP installation. Co. offers:
★ Extensive training in up-to-date technology
★ Excellent career opportunities
★ Training in RSX, RTII and RSTS
★ Salary £6,000

Ref. 1057

TRAINEE MINI PROGRAMMER
LONDON

Company requires experienced programmer to work on systems support group. If you have 2 years' COBOL experience under IBM DOS they will train on PDP-11 CORAL and they have opportunities to become involved in ANALYSIS. Co offers
★ Excellent promotional prospects
★ 4 weeks' holidays, STLS, BUPA
★ Subsidised restaurant and company shop
★ Salary £5,500

Ref. 1460

IBM PROGRAMMERS
SOMERSET

Challenging opportunities exist for COBOL programmers with preferably ASSEMBLER, at all levels, to work on a variety of projects. Co. can offer
★ Excellent working conditions
★ Wide range of projects
★ Training in DL/I
★ Relocation expenses
★ Bonus and productivity scheme
★ Subsidised restaurant and sports and social club
★ Salary up to £5,200

Ref. 1442

IBM ANALYSIS PROGRAMMER
LONDON

If you have 2½ years' IBM COBOL experience apply now for this fantastic opportunity. Co. offers
★ Travelling to Europe, Middle East and Africa
★ Installing designing and the development of new programs
★ 1st Class travel and accommodation
★ Long Term Career prospects
★ Excellent company benefits

Ref. 1466

JUNIOR PROG
HOLLAND

Very rare opportunity for ambitious person wanting to work overseas. If you have initiative, good education and approx. 6 months' COBOL, PL/1 or experience of other language then ring NOW! Co. offers
★ Excellent training within world-wide organisation using modern technology
★ Responsibility for maintenance but will move into development areas
★ Centrally based—Amsterdam
★ English speaking country
★ Salary 35,000 guilders (£8,750 pa)

Ref. 1449

PL/I PROG
HOLLAND

Our client a major and successful concern, wishes to strengthen its European programming team. Running IBM 370 hardware under DOS/VS, the Co. seeks ambitious person with PL/I experience and DL/I, CICS or COBOL being an asset. Co. offers
★ Involvement in development of new and exciting projects
★ Opportunity to work with an expanding organisation operating world-wide
★ Centrally based, AMSTERDAM
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This is only a small selection of posts we have available at present. If however, you don't see anything to suit your requirements please do not hesitate to telephone us. We have a wide choice of jobs at various levels throughout the U.K.

For the above positions — please telephone 01-734 0152/3010 (24 hours) quoting the respective reference number, or write to our London office.

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ICL Total Database Progs	6 Months Sheffield	£230 PW
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Rates are reviewable and contracts renewable. Telephone: Perry Butler or Melanie Fawkes, 061-833 9341/3, 820 Royal Exchange, Manchester

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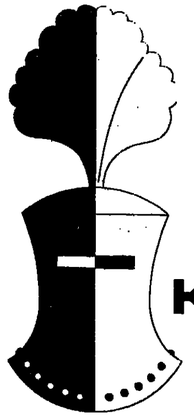

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A major manufacturing organisation with impressive worldwide export achievement records is currently expanding their data processing function and wish to augment their team with an experienced Analyst.

The company operate an IBM 370/138 Installation with a teleprocessing network. Production systems access a database and this is an area that is certain to be expanded.

An Analyst, with experience of computerised production control is required. The position may also interest those currently employed in the user area who would be interested in using their technical expertise in the computer industry.

The successful candidate will be responsible for the further development of the company's production control systems. This will probably involve requirements planning and capacity planning in the short term and may well extend to cover mini-based shop floor data collection in the future.

The company offer an excellent package of benefits and generous relocation expenses are available.

24-hour answering service

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UNIVERSITY OF SOUTHAMPTON
Faculty of Mathematical Studies
Computer Studies Group

Senior Experimental Officer

Applications are invited for the post in the Computer Studies Group to be responsible for the running of the Computer Studies Teaching Laboratory currently equipped with PDP-11/34, 11/40 and LSI-11 Computers, and terminals to other machines in addition to supervising the day-to-day activities of the Laboratory the person appointed will be responsible for the maintenance and documentation of the systems software, and will take a large part in the development of new software. Experience of minicomputers and their software is essential, and a degree in Computer Science or equivalent professional experience is desirable. Familiarity with PDP-11 software and/or UNIX will be an added advantage.

Salary within range £3860-£6178. Initial salary according to qualifications and experience USS benefits

Applications to: E. G. P. Roberts, The University, Southampton SO9 5NH.

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Department of Business Studies

LECTURER I IN COMPUTING STATISTICS AND MATHEMATICS

A graduate qualified teacher is required for 1st September, 1978, to teach the range of subjects up to GCE 'A' and O.N.C. level. A knowledge of the application of these subjects to business would be an added recommendation.

Application forms, returnable by 12th May, 1978 and further particulars available from the Clerk to the Governors, telephone Chippenham 50501, ext. 27.

Operator

Winsford, Cheshire

We have a new opening for a 1900/2900 Operator to join a small team working 3 shifts at our Winsford Manufacturing Plant. The installation, which is in the process of being commissioned, consists of a 2904 and twin 7503 RJE terminals linked to twin 1904S mainframes in Stevenage.

The Corporate Systems staff at Winsford provide a complete management information and data processing service to the site. The operator will form a particularly important link in this service.

We wish to recruit a person with at least two years' operating experience, who has knowledge of GEORGE 3 and is capable of developing their career into job control. This is the ideal opportunity for someone with ambition to enter this successful company at a time and point for maximum career progression. Relocation assistance is available where appropriate.

For further details and an application form please contact Barry Kitson, Corporate Systems Personnel Department, ICL, Wenlock Way, West Gorton, Manchester, quoting reference CW1817. Or phone 061-223 1301, ext 2645.

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IBM SYSTEM 3/10

OPERATOR

WANTED WITH MINIMUM EXPERIENCE ON SYSTEM 3 OF 12 MONTHS.

MUST BE PREPARED TO WORK FLEXIBLE HOURS AND OVERTIME, AS THIS IS NOT A 9-5 JOB. OPPORTUNITY AND TRAINING WILL BE GIVEN TO ACQUIRE A KNOWLEDGE OF RPG II, WITH SUBSEQUENT PROMOTION TO OPERATOR/PROGRAMMER.

OFFICES SITUATED NEAR OXFORD CIRCUS.

£3,800 p.a. AND OVERTIME
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UNIVERSITY OF MANCHESTER DEPARTMENT OF CHEMISTRY

Applications are invited for a

POST DOCTORAL RESEARCH

post to work on molecular collision theory. A background in molecular collision theory would be advantageous but is not essential. The appointment is for one year in the first instance. Salary within the range £3,660-£4,130 per annum. Superannuation.

Applications with curriculum vitae and names of two referees by June 30th, to Dr. J. N. L. Connor, Department of Chemistry, The University, Manchester M13 9PL, England.

Could you program for Concorde?

It takes some pretty sophisticated programming to ensure a smooth flight for the world's fastest passenger plane. Concorde's ability to span the globe in a matter of hours, together with its totally different technology, poses new problems in provisioning spare parts, flight planning and in maintenance control. But these are all part of a vast range of computer activities supporting every British Airways take-off and landing worldwide.

In 1978 we plan to carry 16 million passengers on 200 aircraft to close on 200 destinations. Translate those figures into computer systems requirements and you will have some idea of how important programmes are to a major international airline. We use IBM and ICL mainframes and a variety of mini computers hooked up to a communications network supporting over 3000 terminals in over 150 countries.

As new equipment and techniques become available the scope and depth of our computer support is continually expanding. Real time programming, on line databases, interactive program development and sophisticated data transmission are all in use; British Airways (an acknowledged industry leader) works on the frontiers of computer technology.

We have vacancies for programmers in any language with at least 12 months applications or software programming experience and the ability to hold a place in a really dynamic computer environment.

Starting salaries of up to £4500 are now being offered. Promotion can lead to more senior positions up to £7200 and beyond. Benefits include extensive sports and social facilities and favourable holiday air travel opportunities. When you plan a career with British Airways you are guaranteeing yourself a stimulating future.

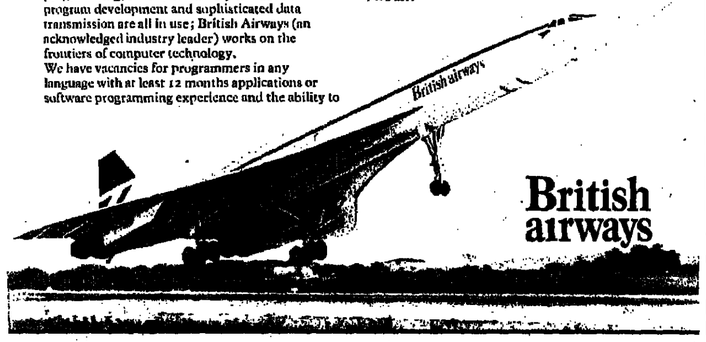
Now you know what is in the air, get in touch. Drop in for an informal chat with one of our Project Managers at The London Interviewing Centre, Knightway House, 20 Soho Square, London W.1. (close to Tottenham Court Road Tube Station) on Wednesday 10th May or Thursday 11th May between 1600 and 2100 hours.

or

Call 01-897 3246/7 for an early interview

or

Write today to:—Head of Recruitment & Selection, British Airways (815/CW/MK), P.O. Box 10 Heathrow Airport—London, HOUNSLOW TW6 2JA



British airways

We've got some good news for an Operations Manager.

And we've got some bad news.

The good news is that Europe's fastest growing retail company is installing a large computer system–a PDP 11/34 linked to an 11/45 operating under RSX11–and that we're looking for a resourceful and ambitious man or woman to shape the entire future of data processing operations within our organisation. A future which includes the establishment of a nationwide tele-processing network comprising some 200 terminals.

The bad news is that we want to go live through at least 60 stores within the next 6 months. Which will mean motivating and organising a 7-day week operations cover as soon as you get here, and maintaining it throughout the initial stages.

Mind you, if you're the type who likes job interest and involvement, that will read more like good news because it will convince you of our commitment to computerisation, and give you some indication of the career opportunity open to you.

As an in-house expert, your growth rate should be as spectacular as ours (we're currently opening 12 new stores a year).

And the good news continues. A salary of around £6,500 will be supplemented by a 1600 cc car and expenses–not to mention a range of benefits which includes free life assurance, a contributory pension scheme, LV's and a generous staff discount facility.

You will be Wembley-based (relocation assistance will be provided where appropriate) but your need to maintain close contact with your users once the system is in and running, will necessitate some UK travel.

If all this sounds good to you–and provided you can bring us a high degree of technical proficiency supported by telecommunications experience ideally with digital equipment–please write, with full details, to: Mr. J. T. Beer, MFI Furniture Centres Ltd., New Stadium Works, North End Road, Wembley, Middlesex. Or phone him on: 01-903 1366

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UNIVERSITY OF SOUTHAMPTON

Institute of Sound and Vibration Research

Applications are invited for the post of

MANAGER

for the Data Analysis Service in the Institute of Sound and Vibration Research.

Candidates should have experience in the operation of mini computers for the analysis of time varying signals.

Salary scale £3660-£6178 or £5954 to £7038 per annum. Initial salary will depend on qualifications and experience.

Further particulars may be obtained from D. A. S. Copland, The University, Southampton SO9 5NH, to whom applications should be sent not later than 30 May, 1978. Please quote reference 355/A/CW.

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Our Head Office is situated in a pleasantly rural part of Surrey near the North Downs, easily reached by the M25/M23. A salary of c.£5,000 + company car is offered plus usual fringe benefits.

Applications to address below or telephone Caterham 48464, Graham Turner Ext. 207. Croudace Limited, Croudace House, Caterham, Surrey.

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We are Canada's largest general merchandise retailer, with an annual sales volume in excess of two billion dollars. We operate over sixty retail stores, catalogue centres, distribution centres and over seven hundred sales offices located from coast to coast. Our data processing expansion programme has created the following openings in our head office, located in Toronto.

PL1 PROGRAMMERS

Applicants must have a minimum of three years PL1 experience, and have developed strong technical skills and be able to work effectively as a Development team leader. Experience with CICS, System 2000 or other data base management systems is a definite asset. Our team development approach demands good interpersonal skills, demonstrable leadership capabilities and a thorough understanding of structured techniques.

Salary range $19,000.00 to $22,000.00 per annum.
Approx. £8,965 to £10,375 p.a.

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Applicants should have at least three years experience in developing and supporting the system software and hardware in a large-scale MVS installation. A detailed understanding of the internals of at least one of MVS, JES2, CICS, System 2000 or PL1 is mandatory. Supervisory experience is a definite asset.

Salary range $19,000.00 to $23,000.00 per annum.
Approx. £8,965 to £10,850 p.a.

Successful applicants will normally possess an applicable degree from a recognised university or equivalent qualification, and have a proven record of job stability.

Personal interviews with a Senior Company Representative will be arranged in London commencing May 8th. Interested candidates are requested to submit immediately in confidence a detailed resume to:

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Present position _____ Salary _____
Position sought _____ Salary required _____
Signature _____ Date _____

FIRST FOLD BACK

EDUCATION (including part-time study)

Dates	Qualifications

Name, address nature of business	Dates	Position and type of work	Computer hardware software and languages	Starting and final salary

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THIRD FOLD BACK

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ANALYST PROGRAMMER

(Ref: PHF 11/5)

Salary range: £4349-£4910

The Executive is a user of the West Yorkshire Joint Computer Committee's IBM 370/168 with 3330 disks and operating under OS/VS1.
Processing of the Executive's systems is from several remote job entry terminals, and interactive terminals are used for program developments. Extensive systems development and systems redesign of both commercial and transport based systems are planned.
Applications are invited from persons with a minimum of two years' programming experience, principally in COBOL and a working knowledge of system design and implementation.
The Executive offer the following benefits concessionary travel, canteen facilities, a good pension scheme and modern working conditions. Additionally a staff bus operates between Leeds and Wakefield.

Application forms are available from the Personnel Section, WYPTE, Metro House, West Parade, Wakefield (Tel: 0924-78234 ext 284) to be returned no later than 17th May, 1978.

Metro

AnCO – The Industrial Training Authority

SYSTEMS ANALYST

DUBLIN

Applications are invited for the above post in the Data Processing Division, in Baggot Court, Dublin.

Applicants should preferably be educated to third-level standard and have at least three years' data processing experience in both academic and practical contexts. They should be articulate, logical and have a capacity for accurate detailed work.

The salary scale rises to £6,830 per annum and the point of entry will depend on experience and qualifications. There is a contributory pension scheme in operation.

Application forms are available from
Personnel Officer,
P.O. Box 456, Baggot Court,
Upper Baggot Street, Dublin 4.
Telephone 685777.

Completed forms, quoting reference 220/1 should be returned not later than 16 May 1978.

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for one of our product groups. You will be responsible for co-ordinating, implementing and monitoring programs to increase sales force effectiveness on major products and accounts in Western Europe. Activities will also include assisting in planning, proposales, training and special requirements for these accounts and products, reporting to a European Product Manager.

The best qualified candidates will be those who have successful sales experience, preferably in mimicomputers and/or terminals. Businesslike appearance, an aggressive attitude, proven organizational skills, the ability to communicate well and a technical aptitude are also vital. Fluent English is essential and other languages will be an advantage.

Applicants desiring responsibility and challenge can expect a good salary, a share in profits and excellent career opportunities in a rapidly expanding company. Write and send your curriculum vitae to: Gordon Gunderson, Tektronix Datatek N.V., P.O. Box 159, Badhoevedorp, The Netherlands.

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BOC Datasolve has some great opportunities on the line.

With a network of 14 Data Centres operating 16 principal mainframes, telecommunications is obviously a big part of BOC Datasolve's business – a 90% part to be precise. But our telecommunications role doesn't stop there. Because as well as developing and maintaining data communications systems for our own use, we also advise the entire BOC Group on every aspect of speech communications – from telephony to facsimile transmission.

So it's no exaggeration to say that our involvement across the whole field of telecommunications work is probably without equal.

And that the career opportunities these jobs can offer you are without equal, too.

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We're looking for a really professional all-rounder – a man or woman with a good ten years' experience in business communications, with special emphasis on data communications in IBM, ICL or Honeywell environments.

Based at our Sunbury Data Centre, you'd lead a team providing a cost-effective advisory service to all Datasolve locations, a role which includes demonstrations to potential and existing clients and evaluating new data communications hardware as it comes on the market.

As the role involves considerable UK travel, we'll provide a car. As for salary, anyone now earning around £6,000 will find this opportunity highly attractive.

Data Communications Consultant

This is really a technical advisory role, in which the majority of the work will centre on communications hardware – associated with IBM, ICL and Honeywell systems. So you'll need telecommunications experience on these types of hardware, as well as a thorough knowledge of telecommunications services currently available. You'll probably be in your mid to late 20's, and we can certainly offer you an improvement on your current salary of around £5,000, as well as giving you a car.

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If you like the idea of joining a company that's growing faster than the market, in an area of activity that's growing faster still, 'phone Roger Barber on 01-637 7141 (weekdays) 0634 360447 (weekends). Alternatively, write to Ros Baker.

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BOC Datasolve Limited, 99 Staines Road West, Sunbury on Thames, Middlesex. Telephone: Sunbury 85566 ext. 219.

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(Computer Services Manager)

Rapidly expanding Engineering/Industrial Group, *urgently* seeks a *young* career minded Computer Professional with the *right attitude* towards Data Processing.

A minimum of 2 years Programming in NEAT/3 on NCR hardware is essential *plus* a desire to be involved in Systems progressing to overall responsibility for the D.P. Department.

For further information about this *CHALLENGING* opportunity telephone Bob Williams

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Faculty of Mathematics

LECTURESHIPS IN COMPUTER STUDIES

Applications are invited for three lectureships in computer studies. **Post 234** is tenured, and applicants should have had experience of commercial or industrial computer applications. They should either have taught in an institution of higher education or have had experience of technical writing. Experience of data base systems would be an advantage, because initially the successful applicant will work as part of the course team producing the M352 "Computer Based Information Systems" which is scheduled for first presentation in 1980.

Post 160 is for two years, and **post 161** is permanent. Successful applicants for these two posts will be involved in the writing of a second level computing course to replace the Faculty's two existing courses PM 951 "Computing and Computers" and M251 "An Algorithmic Approach to Computing." The Faculty would like the successful applicant for the tenured post to begin work on or around 1st June 1978; the temporary post will run from 1st January, 1979 until 31st December, 1980.

The two tenured appointments will be made at a suitable point on the Lecturer scale (£6860-£7,308), and the two year appointment will be by secondment (where the University pays an employer the cost of the seconded person's salary, plus any subsequent increments, increases).

Application forms and further particulars are available, by postcard request please, from **The Personnel Manager (LC83), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL, or by telephone from Milton Keynes 53868 (24-hour answering service). Please quote the number of the post that interests you. Closing date for applications: 19th May, 1978.**

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IBM 370 OS/VS1 — £4500
2 years' experience with good JCL knowledge for this North London installation. Good career prospects, and perks include subsidised loans — Ref. MH18/1

IBM 370 DOS/VS — £4200
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18 months+ experience, including OCL and utilities, for this installation based in Middlesex. — Ref. MH18/3

IBM SYSTEM 3 — £3600
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East London site requires operator with 2 years' experience who has the potential to progress shortly to shift leader. 2 shifts — Ref. MH18/5

ICL 1900 GII — £4000
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ICL 1900 GII — £4000
West London installation upgrading to 2900 range require operators with 18 months+ experience. Excellent promotion prospects. — Ref. MH18/7

UNIVAC-EXEC — £4100
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£4,000 to £5,500 inc. N. LONDON

A major IBM 370/OS user is offering really excellent pay including high salary and paid overtime plus full removal expenses. You must have a minimum 1 year OS experience though. CW18/1 Patricia

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If you are into DOS/VS then this 2-shift system, no nights, will be attractive to you. They provide a high basic salary and 4 weeks holidays and you will work for an international company. CW18/4 Patricia

JUNIOR PROGRAMMERS
£3,000 to £4,300 S.E. ENGLAND

You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you. Some offer mortgage assistance to the right candidates after short period with them. CW18/5 Annette

TIME SHARING PROGRAMMERS
To £6,800 C. LONDON

If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four nationally known companies who would offer you an exciting job in pre or post sales support. Some offer generous bonus schemes. CW18/6 Michael

MINI COMPUTER PROGRAMMERS
£4,000 to £7,250 LONDON & HOME COUNTIES

If you have experience in ASSEMBLER or micro-code or communications for at least 1½ years then a whole exciting field is open to you. We now have opportunities in SW, NW or W. London, Surrey, Berks and Hertfordshire for competent people in this rewarding field. The future is definitely going to be with the MINI-computer professional. Telephone for details. CW18/7 Michael

SYSTEMS PROGRAMMER
£6,000 MID. KENT

A major industrial organisation using a large IBM 370 computer is soon changing to the IBM 30/31. In order to make this change-over as smooth as possible they require a systems programmer. Excellent perks with an active S & S Club. CW18/8 Annette

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c. £6,300 SLOUGH

If you like taking charge then here is an ideal opportunity to extend your supervisory experience and build upon you IBM COBOL knowledge in this DOS/VS, CICS, DL/1 installation. This major industrial organisation offers an active S.S. Club, 4 weeks holidays and a non C.P.S. CW18/9 Annette

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A major manufacturing company is investing heavily in systems plans within their D.P. department and requires extension of commercial analysts especially those with real time application involvement. Although ICL equipment is used your actual machine experience is unimportant. The firm offers generous relocation expenses and 4 weeks holidays, etc. CW18/10 Annette

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£6,500 – £10,000 CENTRAL LONDON

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FREELANCE PROGRAMMERS
To £260 p.w.

Apply now for the latest vacancies, IBM, HONEYWELL, DEC & ICL programmers welcome. Earn a summer holiday paid break plus an attendance BONUS. Ask for the Contracts Officer on 01-995 5485. CW18/13 Irene

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UCA RECRUITMENT CONSULTANTS — Universal Computer Associates Ltd., Data Express House, 3 Prospect Place, Heathfield Terrace, Chiswick, W.4. 01-995 3883 (01-958 6138) EVENINGS

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METROPOLITAN BOROUGH
OF SANDWELL
FINANCE DEPARTMENT

COMPUTER DIVISION

We provide a complete data processing service to the Authority using an ICL 1902T providing both batch and on-line facilities under George II+. The machine is currently under review and a major upgrade is proposed for the early 1980s

We need to extend our services further and we are looking for suitably qualified staff to help us do it.

SENIOR SYSTEMS ANALYST
Up to £5,800
+ casual car user's allowance

Applicants must display an ability to communicate at all levels and have a proven record of major systems design and implementation. Experience in designing on-line systems would be an advantage

SENIOR PROGRAMMER
Up to £4600

Applicants must have at least two years' COBOL experience together with some knowledge of Teleprocessing.

TRAINEE PROGRAMMER
Up to £3000

Applicants must have at least two "A" levels in appropriate subjects. No experience is necessary as training will be given.

Further details may be obtained from Mr. D. Owen, Systems and Programming Manager, on 021-558 1461, ext. 123.

LOUGHBOROUGH

ANALYST/PROGRAMMER

We are looking for a Cobol Programmer with commercial systems experience, and preferably with some Systems Analysis experience.
The job — to assist with system design, and also to prepare system specifications for programming. The continued use of existing programming skills will be possible.
Hardware — IBM System/3, 15B, 96K, Disk, Tape Diskette.
Particularly attractive working conditions in a very convenient location.
Salary — Negotiable, above £4,000.
Please telephone for more information, or send written applications, together with detailed personal history, to:
Mr. D. J. Theobald
Office Hours: LOUGHBOROUGH 65445/6
Evenings and weekends: NOTTINGHAM 232988
Foss Computer Services Limited
Charnwood Parade, Loughborough LE11 0BW

To £8.5K — D.P. MANAGEMENT — Suffolk
A person with good commercial and managerial experience is required by our Client for new 2/43 installation using COBOL for order processing and management information systems. Relocation assistance

c£8K — PROJECT LEADER — Southampton
Our client prefers individuals with manufacturer or software house experience acquired on mini/micro commercial systems using COBOL and BASIC.

c£8K — ANALYST PROG. — London
This requirement is for development of a project for stock and sales accounting in both batch and real time modes on a network of PDP 11 machines. Retraining provided as necessary but commercial experience essential.

188 Finchley Road, London, NW3 6HP

COMPUTECH 01-794 0202

The Computer Consortium of Bath, Kingswood and Wansdyke District Councils

Require

TWO ANALYST PROGRAMMERS

A.P. 4/5 £3,861-£4,615 per annum.

To participate in design, preparation and introduction of new systems common to all three Authorities.
Applicants should have at least two years experience of analysis on successful systems, and should have a sound knowledge of Cobol or a similar language.
The Consortium uses a Honeywell Level 62/80 Computer at Bath, with a Remote Terminal at Kingswood.

Application forms can be obtained from the Director of Personnel Services, 8a Terrace Walk, Bath BA1 1LW. Telephone Bath 28411 ext. 484 to whom they should be returned as soon as possible.

Bath City Council

SALES MANAGER SAUDI ARABIA

BASE TO £12,500 TAX-FREE

+ BONUS TO 50% (25% minimum first year)
+ CAR + FURNISHED FLAT with utilities
+ SCHOOL FEES + 4 HOLIDAYS PER YEAR

ONE OF THE WORLD'S TOP COMPUTER MANUFACTURERS which is a market leader in the Middle East requires a Manager to head its commercial sales dept. in Saudi Arabia, where the company is strongly established.
BENEFITS: Annual 30-day holiday with fares to Country or origin. Also 3 one-week holidays in Athens with a daily allowance of $75.

RECREATIONS: Such sports as fishing, swimming, horse-riding + social activities within the large expatriate community.

LOCAL SCHOOLING is good up to the age of eleven.

REQUIRED PROFILE: A good knowledge of commercial/industrial applications is essential. In addition, suitable candidates are likely to have experience of mainframe sales and management.

THIS IS AN OPPORTUNITY TO MAKE CONSIDERABLE SAVINGS!

PLEASE TELEPHONE OR SEND A CURRICULUM VITAE.

CW921

Crown House, Morden, London SM4 5EU
recruitment division
01-540 8311
24-hour answering service

JBA

Project Managers

North London — **neg £7,500 +**

Continued expansion and development within our clients organisation has created vacancies for capable, self-motivated project people to join its management team. Teams tend to be small but highly effective with total responsibility for design implementation and support of major applications. Specific experience of accounting or marketing systems will be considered an advantage as is a proven track record in project management. These are key appointments within a major bureau, therefore salaries will reflect the importance of the posts. Subsequent career development is dependant on the individuals ability.

Contact: Margaret Stevens

Sales Executive

Sheffield–Leicester Area — **c. £7,000 + commission + car**

A well established and successful manufacturer of mini-computer systems, designed for the commercial and end-user market, seek to increase their remarkably effective sales team in the north. Applicants must have a proven track record either in the sale of similar equipment or in a support type position. In any event, the successful candidate will be one who is dynamic, self-starting, and with a sound d.p. background.

Contact: Mike Creamer

Programmer/Analyst

South Essex — **Salary negotiable**

Our Client is a well established manufacturing company with an expanding world-wide market. Due to this expansion, we now wish to recruit a programmer/analyst with 18 months+ O.S. COBOL experience. Experience in BOMP or FINANCIAL applications would be an asset. However, training will be given whenever needed.
In addition to a chance to get involved in analytical design work, we give self-motivated D.P. professionals a progressive career path. The company also offers, re-location assistance, where applicable, a subsidised canteen, and an excellent pension scheme.

Contact: Mike Creamer

Technical Author/ Software Specialist

Berks — **up to circa £7,000**

A leading, innovative consultancy seek a team person to document operating system software. Solid experience of operating system design (internals) or programming is essential.
The successful candidate will determine own future and development of career in this unique job opportunity.

Contact: Jim Baker

Programmer Analyst

Bucks — **c. £6,000 + BUPA**

A rapidly expanding commodity production company are seeking a programmer analyst to manage their data processing activities, ranging from development of new systems, to total responsibility for a small team. The applications will be commercial and financial involving absolute liaison with all sectors of the company.
Applicants must be thoroughly conversant with commercial and/or financial systems, preferably on mini-computers, ideally PDP/RSTS, and have strong leadership qualities.
Excellent salary and benefits coupled with management status.

Contact: Mike Creamer

AUSTRALIA

We heard this week that another group of d.p. emigrants have been successfully placed by our associate company in Sydney, within a short time after arrival. In fact, several of them, had two or three offers from which to choose.
If you are a d.p. professional (e.g. programmer, analyst, computer engineer, or more senior grade) with over three years experience and the determination to start a new life in Australia – JBA is your vital link to that important job you need when you get there. We do all the ground work for you and open up the contacts so that interviews can be firmed up as soon as you arrive.
Contact Mike Creamer and have a chat about how JBA can help

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

Mini Experience? Pioneering Interests? Eager to Prove Your Ability? **U.K.**

KRATOS

Instem Limited — Stone, North Staffs

Programmers to Project Leaders £3500-£6000
Process Control and Technical Development Project Staff — North Midlands

A wide variety of development support staff from Junior Programmers to Project Leaders are required to work on a wide variety of micro processor and mini computer based systems for industrial and laboratory automation applications world-wide. Applicants should preferably be Graduates. Experience of Minis in a real time or on line environment will be beneficial. Machines of particular interest to us are DEC, Data General, Intel etc, using ASSEMBLER or FORTRAN. Equally any RSX experience would be particularly attractive. Please telephone urgently either Mrs Hilary Prosser on Stone 832131, or Don Philip on 0782 623665.

Hilary Prosser
Instem Ltd.
Mount Rd., Industrial Est.
Stone
Staffs ST15 8LX
Stone 2131 (0785 83)

Don Philip
EMS Group
0782-623665

Consultants: John Wood and Don Philip

Kuwait –

EMS & Inter-Consult –

The opportunities you've all been waiting for!

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Project Leaders to £15000 + Accom

We seek Senior Analysts, capable of team control, whilst at the same time handling personal project work. All candidates must have a minimum of 3 years' IBM experience with at least 2 years' DOS COBOL programming. Applications are mainly Accounting and Inventory Controls and other commercial systems. Candidates should be educated to a minimum HND standard and have no children. A driving licence would be especially advantageous. Motivated, career conscious managerial level candidates are assured of excellent employment prospects. We intend carrying out early interviews for these positions. Please telephone today for an application form.

Analysts & Programmers – Numerous Banks to £12000

Hardware requirements vary mainly between IBM and NCR with languages being COBOL, ASSEMBLER and the occasional use of NEAT 3. Any CICS experience would be especially useful. Kuwait at present has both new development work with first-time computer users at a wide number of banks, to established users initiating large increased on-line project development. Equally, junior positions are also available for commercially experienced staff with 18 months' or more experience. Telephone today for application forms.

O&M Consultants/Microfilming c £11000

Ability to set up a microfilming unit, organising the hiring of preparation staff and training them where necessary, as well as undertaking user feasibility staff will be important. The job will be autonomous from the main consultancy group, necessitating a sound microfilming knowledge with the ability to make correctly founded decisions when the occasions arise. Other O&M related projects will also be undertaken after the unit is operating effectively, therefore offering a good progressive career opportunity.

Arab Nationals — Banking

Preference will be for candidates with a recognised qualification, from HND upwards. Banking experience would be particularly useful, especially in an on-line environment. Young Analysts/Programmers are being sought in addition, particularly with PDP experience. Arab Nationals with alternative machine experience will equally be considered. Senior staff will work with Consultants currently developing a computerised system and will help during installation, gaining relevant experience so as to ultimately take over project management functions.

CMC Programmers — Negotiable

A newly formed Turnkey Systems Group in Kuwait need experienced CMC programming staff preferably with basic systems knowledge to rapidly assist with the design and programming of client application systems. Ability to train other group staff in CMC Programming specialities would be especially advantageous. A driving licence will be essential. Candidates can be single or married, but must have no children. The company has already gained early sales and now seeks motivated staff to help them increase their marketing successes and to expand the group.

IBM Analysts & Programmers to £12000

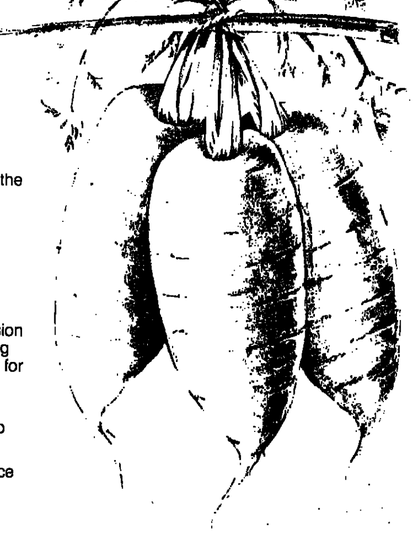
One of the largest trading groups in the Middle East has additional vacancies for experienced IBM development staff to assist with the maintenance and enhancement of a wide range of existing Accounting and Inventory Systems in addition to preparing new interfacing systems in a progressive move towards M.I.S. Assistance will be given with accommodation allowances and furniture loans. Equally, concessionary car purchase facilities will be offered as an attractive fringe benefit.

IBM Senior Systems Analysts c£12000

We seek a candidate, preferably with some Oil Industry experience to assist with the maintenance and development of inventory systems. Extensive CICS and DL/1 work is involved. Subsequently, a minimum 2 years practical experience of CICS is sought and at least 1 years DL/1 Analysts should have a sound knowledge of Database. Ability to work in a consulting role will be advantageous.

EMS CONSULTANTS LTD
BELLOWS STREET
NEWCASTLE UNDER LYME
STAFFORDSHIRE ST5 1HD
Telex 36436

ON THE 9th MAY WE'LL BE DANGLING CARROTS.



You could end up with a plum.

On the 9th May in regional centres throughout the country, Systime Limited is holding a series of informal interviews for a variety of personnel in computing.

This is an unusual opportunity to further your career in one of the world's fastest growing computer companies. Our experience and reputation as a major manufacturer in mini-computers, together with the rapid expansion plans ahead, ensures both a stimulating working environment and excellent career opportunities for the future.

Salary conditions and bonus' all reflect the company's assured market position. Certain job functions include company car.

The carrot has been dangled, now's your chance to taste one of these plums:

Systems Analysts

A minimum of three years experience in commercial system design and implementation, preferably for on-line interactive systems. A background in programming or a knowledge of the PDP II Series would be advantageous. A car allowance is available.

Analyst/Programmers

A minimum of three years commercial systems and programming experience is required.

Programmers

With at least 18 months commercial programming experience, preferably in a real time mini-computer environment. A knowledge of Basic Plus/RSTS is desirable but not essential.

These vacancies offer excellent opportunities to join one of the most exciting sectors of the computer industry dealing with total on-line business systems. They offer competitive salaries with a generous bonus scheme.

Applicants for these positions should attend the informal interviews being held or if you cannot attend on the date indicated, applications may be made direct to the appropriate Regional office.

Informal interviews are being held from 5.00-8.30pm on 9th May, 1978 at the following hotels:

London
The Bloomsbury Centre Hotel
Coram Street
LONDON WC2

Richard Pinkham
Systime Limited
Centenary House
98 Camden High Street
LONDON NW1 0LT
Tel: 01-388-7921

Manchester
The Grand Hotel
Aytoun Street
MANCHESTER

Roy Green
Systime Limited
Glebe House
Atkinson Road
Urmston
MANCHESTER M31 1AD
Tel: 061-747-7424

Leeds
The Queens Hotel
City Square
LEEDS

Head office:
SYSTIME LIMITED
Peter Wilkinson/Gordon Higgs
Concourse Computer Centre
432 Dewsbury Road
LEEDS LS11 7DF
Tel: 0532 707411 or 707261

Leicester
The Holiday Inn
St. Nicholas' Circle
LEICESTER

Andy Coleman
Systime Limited
Kimberley House
47 Vaughan Way
LEICESTER
Tel: 0533-22212

Glasgow
The Albany
Bothwell Street
GLASGOW

David Watt
Systime Limited
Standard Buildings
94 Hope Street
GLASGOW G2
Tel: 041-221-6152

Dublin
Royal Dublin
Upper O'Connal Street
DUBLIN

John More
Systime Limited
32 Molesworth Street
DUBLIN
Ireland
Tel: Dublin 767635

Central Support Operations

Central Support Operations are based at Systime's head office in Leeds and consist of three departments.

Technical Support. Responsible for the development, maintenance and support of basic software, including operating systems, compilers and development aids.

Applications Support. Concerned with the development and support of Systime application packages which will continually extend to new application areas.

General Services. Responsible for the bureau operation, software distribution, training and technical administration.

Technical Support

Consultant – Communications. Applicants should have extensive experience in the communications field, preferably including projects involving DEC equipment.

Support Specialist. Applicants should have a minimum of five years computer experience with a bias towards operating systems or compilers. Experience of DEC operating systems or Basic Plus would be advantageous.

Systems Programmer. Applicants should have a minimum of three years programming experience and a significant interest in technical development. Previous involvement in basic software would be advantageous.

Applications Support

Support Specialists. Applicants must have a minimum of five years experience with a specific knowledge of one or more of the following areas:

Financial Accounting – sales ledgers, purchase ledgers, nominal ledgers.

Personnel Accounting – personnel management, time recording, payroll.

Inventory Control – order processing, stock recording, inventory accounting.

Manufacturing Systems – parts explosions, material requirements planning, production scheduling, workshop documentation, work-in-progress.

Systems Engineers. Applicants must have a minimum of three years experience, including a period as analyst/programmer.

Applications Programmers. Applicants must have a minimum of one years commercial programming experience, preferably in an interactive systems environment.

General Services

Department Manager. This is a senior management appointment and applicants must have had at least two years proven managment experience. Responsibilities will include the recruitment, career development and reporting procedures for all personnel associated with the bureau, training and software administration. A company car and assistance with relocation expenses will be provided.

Training Officers. Additional personnel are required to develop training programmes for Systime and client staff. Courses will be relevant to programming (Basic Plus), operating systems, computer operations management and systems design.

All positions offer competitive salaries and a generous bonus scheme.

For all central support positions, applicants should write or telephone Bev Stevens at Systime head office or if preferred applicants may attend the informal interviews at the hotels indicated, where their interest will be discussed and reported.

SYSTIME

COMPUTE OUR NUCLEAR FUTURE AT RISLEY, NUCLEAR CENTRE FOR THE U.K.

British Nuclear Fuels Limited is one of the world's largest suppliers of nuclear fuel services and is currently engaged in a major expansion programme. This is creating a rising demand for all kinds of computer applications, personnel and equipment — and coincides with transfer of mainstream computing to an ICL 2980. At Head Office we are meeting the challenge by expanding both *Computer Services Section* supporting company-wide systems development and users in financial, commercial, scientific planning and design departments; and the *Computer Policy Section* supporting Company Management decisions on hardware and software. Opportunities exist for:

SENIOR PROGRAMMERS £4000 — £5290 p.a.
(Currently under review)

The Computer Services Section requires programmers with the ability to design, progress and implement scientific and commercial systems in both batch and interactive environments, working as team leaders, maintaining standards and meeting targets. At least 4 years programming and a working knowledge of FORTRAN and COBOL are essential: knowledge of BASIC, APL and use of time-sharing bureaux is desirable.

EXPERIENCED PROGRAMMERS £2750 — £4290 p.a.
(Currently under review)

To work under the guidance of the Senior Programmers. Applicants should have at least 18 months experience.

For the above posts in programming, qualifications to HNC (or, for certain posts, degree) standard are required.

TECHNICAL OFFICERS £4620 — £5570 p.a.
(Currently under review)

The Computer Policy Section requires suitably experienced computer professionals with Honours Degrees to investigate all factors (technical, commercial, economic and operational) of new technology — from minis to communications, APL to databases. Applicants must have an interest in all aspects and experience in several.

All posts are open to male and female applicants. Salaries within the ranges stated are currently under review for implementation April 1978. Excellent conditions of service include 4 to 4½ week holiday plus 10½ day statutory and privilege holidays, an attractive superannuation scheme and assistance with relocation.

Head Office at Risley is within the nuclear centre, which is part of Warrington New Town where first-class rentable housing is available. It also enjoys superb Motorway access to Merseyside, Greater Manchester and some of the most attractive areas of the North West.

NO STAMP NEEDED! Simply fill in and post this coupon now to: Staff Officer, British Nuclear Fuels Limited, FREEPOST, Risley, Warrington WA3 1BR.

Please send Application Form for the post of: Senior Programmer/Experienced Programmer/Technical Officer (delete posts that do NOT interest you)

NAME .....

ADDRESS .....

.....

Ref 137/78/J170

BNFL
British Nuclear Fuels Limited
at the heart of nuclear power

SENIOR PROJECT MANAGER

J. H. Sankey & Son Ltd. is a national builders' merchant company with over 100 branches and a nine-figure turnover

The company is embarking on a comprehensive development plan that could encompass hardware from micros to mainframe.

A pilot scheme is just starting in two branches using a PDP 11/34 for order entry, invoicing, stock control, purchasing and financial systems.

This is a ground floor opportunity for a person to take responsibility for all group systems development.

The person appointed must be a self-starter with several years' experience of commercial programming and systems design. This experience must include leading at least one major project from start to finish. Experience of PDP-11 and RSTS and BASIC is essential.

The job is based at Wembley but considerable travel within the U.K. will be involved at times.

The appointment commands a good salary and company car and full range of employee benefits.

Application in writing stating background and experience and present salary should be sent in confidence to

E. A. W. Smith, Group Personnel Director
J. H. Sankey & Son Limited
Station House, Harrow Road, Wembley, Middlesex HA9 6DB

SANKEY
THE BUILDERS MERCHANT

CITY OF BIRMINGHAM POLYTECHNIC
Department of Computer Studies and Mathematics

LECTURER II/ SENIOR LECTURER IN COMPUTING

Applicants should be graduates and possess either a higher degree in computing or practical experience of Systems Programming.

Salary scales
Lecturer II £3744-£5985
Senior Lecturer £5523-£6447 (bar) £6909
including 1976 and 1977 supplements

Further details and application forms (to be returned by 16th May, 1978) from: The Personnel Officer (CW), City of Birmingham Polytechnic, P. Block, Perry Barr, Birmingham B42 2SU.

NEWCASTLE-UPON-TYNE POLYTECHNIC
Chief Administrative Officer's Department

SYSTEMS ANALYST (Administration)

To be responsible for the design, development and maintenance of computer based information systems and related Management Services in connection with the Academic, personnel, Financial and General Administrative activities of the Polytechnic. Candidates, who should be professionally qualified and experienced analysts with an administrative background, will be expected to have particular experience in the design of planning and management control systems.

£4150-£5055 (inclusive of supplements), A/C Salary and Conditions: SO1.

For further particulars and application forms, returnable by Monday, 15th May, 1978, please send stamped addressed foolscap envelope to the Staffing Officer, Newcastle-upon-Tyne Polytech ate, Ellison Building, Ellison Place, Newcastle upon-Tyne NE1 8ST.

COMPUTER TERMINAL EQUIPMENT

Tenders are invited for the supply, installation, delivery and service of computer terminal and communication systems at the Traffic Dept., 13 Christchurch Place, Dublin 8.

Copies of instructions to tenderers specifications, conditions of contract, tender forms etc., may be obtained from the Approved Officer, Traffic Department, 13 Christchurch Place, Dublin 8.

Latest date for receipt of tenders in sealed envelopes marked 'Computer Terminal Equipment' is 12 noon on 24th May 1978.

Reckitt & Colman Limited
U.K. Leisure Division

Systems Analyst
C. £6,500

The newly formed Leisure Division of Reckitt & Colman Limited is based at Winsor & Newton Limited in Wealdstone, Harrow, Middlesex. The Division is mainly involved in the manufacture and supply of art and craft materials and includes the world famous names of Winsor & Newton, Reeves, Dryad and Charles Page.

A Systems Analyst is required to work on a complete review of all systems in the operating companies. A minimum of two years systems experience is required but the ability to work on own initiative and liaise at all levels within the division are of paramount importance. There will be deep involvement in projects from feasibility through to implementation.

Please telephone for further details and an Application Form or alternatively send full career details to. **Ames Personnel, 150 Boundaries Road, London, SW12 8HG.**

AMES PERSONNEL
TELEPHONE: 01-767 0611

PROGRAMMER/ ANALYST

Required for IBM installation in North London. Minimum 1½ years' programming experience. Knowledge of Analysis, DOS, and TP an advantage, but not essential. Highly competitive salary plus good company benefits.

Telephone: 01-287 6023
Mr. Hayden

Computer Operations Manager
North West *c.£7,500 + car*

A subsidiary of a multi-national group wishes to recruit an operations manager for its large computer centre in the North West of England. The task is to:

- motivate, direct and co-ordinate 50 operations staff engaged on three-shift working
- provide an efficient computing service
- help the manager of the computer centre evolve data processing within the group (current developments are in the field of on-line applications and mini-computers)

The requirement is for someone who has successfully managed the operations function, including data preparation and data control, in a medium (or large) IBM main-frame installation in a tele-processing environment.

Preferred age middle thirties. Starting salary will be negotiable at around £7,500. There is a car provided. Promotion prospects are well defined and unusually good.

Please write in confidence for a job description and an application (quoting) David Pybus, Price Waterhouse Associates, Southwark Towers, 32 London Bridge Street, London SE1 9SY, quoting MCS/9834.

Computing in Education Administration

Middlesex Polytechnic is currently establishing a new team to develop aspects of a Polytechnic-wide computer-based management information system and corporate model. The initial emphasis is on resource management, covering students, staff, buildings and finance.

The Polytechnic has a DEC system 10 computer and all applications will be developed and operated on-line. Ultimately a central database will be created with which all the applications will interface.

Two vacancies exist at senior level for

Senior Analyst/Programmers
SO1/2: £5044 - £5797 p.a. Inc.

Graduate staff will normally be required together with substantial experience at a senior level in other commercial data processing and/or systems analysis.

Please write for full details and an application form quoting PR/CS/SO, to Personnel Officer (Ref. 84/78), Middlesex Polytechnic, Cat Hill, East Barnet, Barnet, Hertfordshire EN4 8SF.

Closing date: [illegible]

Middlesex Polytechnic

MYRIAD OPERATIONS
Computer Personnel Consultants

BURROUGHS in SURREY

Junior Operators to Shift Leaders — To £5500

A leading British service organisation is currently seeking additional operations personnel to play a substantial role in the future expansion of their computing facilities: a major upgrade being planned within the next year.

You will have a successful operations background to date, and will be keen to pursue an active career in the future. Full training will be given, so if Burroughs hardware is currently alien to you this is a rare opportunity to work on some sophisticated and powerful kit

You should, of course, be available to work shifts, for which a generous allowance is included in the salaries offered. These will be in the range £3500-£5500, dependent entirely upon your experience, and are supported by valuable fringe benefits.

OPERATIONS MANAGEMENT

HOME COUNTIES £6000-£7500

With commitment to data processing having been established, this multi-million pound organisation is seeking a manager for their young and exciting operations team.

In addition to controlling all the normal aspects of computer operations, an ability to set up procedures, evaluate performances and propose new ideas for the continued growth of the installation are qualities that will lead to a full, demanding and rewarding career.

A mature outlook backed by several years' D.P. experience, including telecommunications knowledge and supervisory ability, are distinct advantages since there will also be large involvement with both users and all levels of management

SENIOR OPERATOR

Shift Leader Designate

HERTS CIRCA £4300

An ideal opportunity exists for an IBM DOS/VS operator with a minimum of 18 months' experience to develop their career with this American backed manufacturing company

Running under a two shift system this medium sized installation is in the process of developing several major projects. This position presents a challenge to keen, energetic operators with shift leader potential to demonstrate their ability, and for those with the aptitude, encouragement is shown for progression into programming.

Apart from the generous salary, a comprehensive range of other benefits are offered

ICL in ESSEX

3 shifts £Negotiable

A rapidly expanding computer services organisation is currently seeking additional computer OPERATORS at both JUNIOR and SENIOR levels: i.e. 6 months'-5 years' experience.

Installed hardware comprises a medium ICL 1900 system running under GEORGE II. You are sure of an interesting workload processing a variety of batch and on-line applications.

This is a young company with progressive ideas. Therefore opportunities to further your career are excellent if you are prepared to adapt and develop your current experience.

An attractive range of fringe benefits accompany the generous commencing salary and successful applicants will enjoy working in a pleasant friendly environment.

24-hour answering service
Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 0981

CP

BIRMINGHAM
Paul Mitchell
111 New Street

MANAGER
up to £7,000. Programmer/Analyst.
Au fait with Data General systems programming. Assume command for all D.P. including supervision design and implementation. Manufacturing retail distribution experience preferred.

ANALYST/PROGRAMMER
up to £6500
Manufacturer Software House seek experienced personnel to implement user written systems. RPG II essential.

SENIOR ANALYST & PROGRAMMERS
£8-£6000
Centrally situated manufacturing distribution centre, currently enhancing its existing Hardware to 1902T, to develop on-line and batch systems. A programming background in the case of analysts and COBOL and or PLAN essential for the programmers.

COVENTRY
Stuart James
Coventry Point, Market Way

ANALYST PROGRAMMER
c.£5000
With 3 years background and with experience of COBOL and DATABASE for new development with Coventry Company.

PROGRAMMER
c.£4400
With a minimum 2 years' experience of COBOL, PLAN for 1902 installation. Developing on-line order entry system.

SYSTEMS ENGINEER
c.£4400
Process control applications through minis and micro processors. Multi national firm developing new phase of logic systems and computerised applications.

SOFTWARE ANALYST PROGRAMMER
c.£5200
Three years' experience of ASSEMBLER maintaining and developing effective operations environment.

LEEDS
Irene Rogers
73/75 Albion St.

SYSTEMS ANALYST
£5,500
With excellent insurance background working for a fast moving Bureau environment. Honeywell Level 66/20 — COBOL background. Supervision of staff and user liaison. Promotion prospects are excellent.

PROGRAMMER
£4,500
COBOL ICL installation — inhouse position — company are presently expanding. 2/3 years experience required. Excellent opportunity for ambitious programmer. Promotion to Analyst/Programmer or Analyst/Analyst in near future.

PROGRAMMER SCIENTIFIC
£5,000
For mini/micro systems. Real time industry space. ALGOL, CORAL, FORTRAN, RTL, PL1 required. Scientific data handling and industrial control — particular field. Graduate preferred. Excellent promotion prospects.

SHEFFIELD
Chris Courtney-Stones
54/56 Fargate

SYSTEMS PROGRAMMER
to £6,500
In depth experience of IBM operating systems and network systems. Assembler and VSI are essential. Environ is desirable. The ability to liaise and negotiate on standards would be definite advantage.

SYSTEMS MANAGER/ESS
c£5,300 + review
The initial major function will be the setting up and implementation of standards. Full responsibility for maintenance and direct staff responsibilities. ICL COBOL experience is preferred.

ANALYST/PROGRAMMER
to £5,500
This major installation, with a heavy development programme requires an experienced person who has been involved in the implementation of a major project. Whilst a good programming knowledge is essential, the major function will be implementation of systems and user liaison.

MANCHESTER
David Rhodes
66 Princess St.

ANALYST/PROG.
£5,500
Experience in commercial and COBOL programming. Will be involved in pre sale post sale installation, and troubleshooting for this mini computer manufacturer. Very interesting position with big company benefits and opportunities.

PROGRAMMERS
£5,000 + allowances + bonus
Work mainly from home for leading Software house. Basic requirement is 12 month min. experience of ICL/IBM equipment coupled with one of the following COBOL, ASSEMBLER, PL1 or RPGII. Various grades required urgently.

PRODUCTION CONTROL SPECIALISTS
£6,000 neg + car
Graduate or HND in engineering Discipline. Experienced in an engineering environment with computer based production control systems and systems design. To work for a computer manufacturer on customer specification.

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A Division of BERTRAM PERSONNEL GROUP LTD.

PROGRAMMER/ ANALYSTS to £6500 p.a.

BASIC AMERSHAM **+ significant benefits**

Our client is an independent subsidiary of a £200 million British Group. The company is in the process of turning growth plans into reality, consequently excitement, enterprise and challenge are the order of the day. This all DEC OEM Systems House offers services covering total turnkey implementations, software sales and timesharing bureau, based on 2 x DEC PDP 11/70's and 4 DEC PDP 11/35's.

The company needs to raise its headcount with self-starters who have experience of BASIC PLUS on DEC equipment. Whether you are an experienced Analyst or only have 1 year's programming behind you, they can offer real career prospects in a dynamic environment. Working in a small, identifiable team, you will be involved in a project from start to finish, developing commercial, e.g. accounting, stock control and order processing systems.

The 25+ development group enjoy excellent working conditions and large company benefits.

Call DAVID J. HUTCHINSON to discuss these excellent opportunities further on 01-499 4501.

Ref. RW 18/1

PROGRAMMERS FOR MICRO'S

BUCKS **to £6,500 p.a.**

All the pundits agree, the potential market for microsystems is staggering. Our clients manufacture their own, based on the DEC LSI 11 processor; and with the financial support and credibility of their £200m parent company they are determined to capitalise in the UK. They now wish to build up their software team by recruiting 3 additional programmers.

To fulfill their aims they need to add more DIBOL, FORTRAN and MACRO 11 expertise to the team. Consequently I wish to hear from candidates with 2/3 years or more experience in any of these languages. Successful candidates will work in a technical software department solving problems at a low level through involvement in basic systems design and high level language applications programming. They will enjoy a wide variety of applications.

All the conditions are right for career development; rapidly expanding market, young growing company, financial stability, interesting projects, promotion on merit, attractive salary and working conditions.

Move into micros now and your career could really take off. CALL DAVID J. HUTCHINSON on 01-499 4501.

Ref. RW 18/3

OPERATIONS OPPORTUNITIES in the CITY and BUCKS

A dynamic and fast moving bureau is probably the most invigorating working environment for operations personnel and our clients are just that. This very professional company offers both batch and on-line facilities from 2 computer centres situated in BUCKS and the CITY. Already well established they offer services to both companies within their international parent Group and to many outside users. The department operates a 2 shift system covering weekdays only. Their planned growth has created some real career opportunities for the right people.
IF, AFTER READING BELOW, YOU WISH TO APPLY PLEASE WRITE TO DAVID J. HUTCHINSON DETAILING YOUR QUALIFICATIONS AND CAREER TO DATE.

OPERATIONS MANAGER

BUCKS **c.£6,000**

This person will have total responsibility for the operation of a medium sized installation. Candidates should have the desire to move into junior management and the ability to handle customers. The successful applicant is likely to be aged 26-32 and may have a traditional operations background or be a systems analyst wishing to broaden their career. Relocation will be considered. A full job specification will be available at interview.

SHIFT LEADERS

BUCKS and CITY **to £4,250 + 20% S.A.**

If you are young, competent and ambitious enough to see yourself moving upwards into operations management within 2 years then please apply. As the senior man in the computer room you will control a small team and play an active part in liaising with customers. Aged around 23/25, preferably with 'A' levels, you should have c 3 years ops. experience including on-line systems. Full training will be given, including programming. Here is an excellent opportunity for personal development.

OPERATIONS TRAINEE OPERATORS

BUCKS and CITY **£3-£3,500 + 20% S.A.**

Superb opportunities exist for operators who wish to play a big part in a small team and for bright young people who wish to make their entrée into computing as a trainee operator. Your progress will be up to you. Aged 20-ish you should be alert, able to communicate, and want to take full advantage of the training offered (this includes programming).

WRITE QUOTING REF. NO. RW 18/2 TO DAVID J. HUTCHINSON

hutchinson-scoggins recruitment
10 Dover Street, London W1X 3PH
Telephone 01-499 4501

هكذا من الأصل

Duncan Bransom Recruitment

COBOL PROGRAMMERS up to £6.500

plus overtime & profit sharing

What's it like - working for a firm of consultants?

To start with, life is never dull. You are working steadily all the time with plenty of opportunity for advancing your professional career. With overtime pay and profit sharing, you should be able to add about 25% to your basic salary.

At Duncan Bransom Ltd you will join a team of highly skilled professionals. After a brief orientation period (lasting perhaps about two or three days) you will find yourself on interesting assignments within your existing capacity. Additional training will be provided as required to help you progress through the company.

Naturally you will be expected to be better at your work than the client's own staff and thus the work will only suit those who are highly skilled and also are prepared for plenty of hard work.

The company is a very happy one as witness the fact that no-one has ever left, and there is a high degree of mutual respect amongst all the participants. We don't believe in having too many chiefs and not enough indians – there is only one chief and even he likes to get stuck into the practical work whenever he can tear himself away from the office.

Most of the work is in North and West London, the content being principally commercial data processing and production control. It will be easier for you if you have a car, since you will occasionally have to work at different locations. However, no-one has ever had to stay at a hotel to carry out an assignment, since it is company policy to match the work to suit the individuals concerned.

So – if you have two or more years' good Cobol programming experience behind you (preferably on IBM machines) and are looking for a job where the rewards match the effort put in – come and join us.

If you would like to know more about the company or would just like to chat about it, please contact Roger Griffiths on 01-508 5121. Alternatively you might care to write in for an application form. Under no circumstances will your present employer be approached without first obtaining your permission in writing.

Please write or telephone for an application form to:
Roger Griffiths, Duncan Bransom Ltd.,
37, Hillcrest Road, Loughton, Essex
Telephone 01-508 5121

Duncan Bransom Limited

AICS Association of Independent Computer Specialists

Ref D12

SOFTWARE PROGRAMMERS

Salary up to £5,000 pa (including supplements)

Bored with application programming and coding sheets or operating?

Then use your computing ability and personality by joining our Technical Support Group in the Welsh Water Authority's expanding Computer Services Group.

These posts offer further career and technical training and the opportunity to become involved in the varied and interesting aspects of Operational and Technical Support including extensive TP network and the generation and control of new and existing software.

The Group is responsible for all systems software including COMMS MANAGER, MAXIMOP and DRIVER based programs, software and communications performance monitoring and future hardware planning.

These are new appointments in the Authority's rapidly developing central installation. The initial equipment is based upon a 1902T computer with ICL 7502 Intelligent Terminals located at various sites throughout Wales.

Ideally you will need a knowledge of and experience in one or more of the following: COBOL, PLAN, ICL Communications Software, Utilities, ICL Operating Systems.

The posts will be based at Bridgend, Mid Glamorgan. Excellent conditions of service include generous re-location and possible bridging loan finance.

Assistant Personnel Officer (Ref No 157) Welsh Water Authority Cambrian Way, Brecon, Powys LD3 7HP Closing Date: 18th May 1978.

WELSH WATER AUTHORITY
AWDURDOD DWR CYMRU

PROGRAMMERS

RENTOKIL LIMITED — **EAST GRINSTEAD**

Further programmers of varying experience required for mixed batch/on-line applications on ICL 1902T 64K disc/tape and ICL 1500 configurations using COBOL, PLAN and CDE.

Conditions of employment are generous with fringe benefits which include Contributory Pension Scheme, Profit Share, Free Staff Restaurant and Staff Discount. There is an active Sports and Social Club.

Situated on the Kent, Surrey and Sussex borders, East Grinstead offers pleasant and varied living and recreational facilities.

Salary up to £5,000 p.a.

Write or telephone: A. Appleby
Rentokil House
Garland Road
East Grinstead
West Sussex
RH19 1DY
Tel. E.G. (0342) 27171

Leeds Polytechnic
School of Mathematics and Computing

LECTURER II

Applications are invited for several posts at Lecturer II level. Applicants should be qualified, preferably with practical experience, in one or more of the following areas Operational Research, Statistics: Computing and should be willing to contribute to the School's teaching research and consultancy

Salary Scale (under review) £3744-£5985 — includes supplements

Details from
The Services Officer (C.24)
Leeds Polytechnic
Calverley Street
Leeds LS1 3HE
0532 462823

Please enclose s.a.e

Closing date 17 May 1978.

Senior Systems Programmer

Starting salary up to £7000 pa

London Electricity are seeking to recruit a senior systems programmer to work in their software project team within their Computer Services Department situated 10 minutes walk from London Bridge and Waterloo Stations.

The work of the team includes the generation and support of IBM operating systems and of other programme products, and technical support for 4 application development teams.

The installation is currently operating two 370/158 processors under OS/VS, and uses CICS and DL/1 for teleprocessing applications.

A good knowledge of IBM assembler and of JCL is required, and experience of relevant software is a definite advantage. The salary offered to the successful applicant will be dependent on his/her depth and width of experience within a scale rising to £7600 pa. Training will be given as necessary.

Besides a competitive salary, the successful applicant will have the benefit of good pension and insurance schemes, good social and sports facilities and privilege purchases. A continuous programme of specialist training is given to help professional staff develop their skills in a progressive installation offering excellent opportunities for career development.

To find out more about this challenging post please telephone 01-407 2261 quoting reference CW/2895 during office hours or write to:

The Manager, Computer Services, London Electricity Board, PO Box 74, London SE1 6NL.

The power behind London LEB

Warwickshire County Council
County Engineer's Department

Senior Computer Officer

P.O.1 (1-5) (£4,680-£5,260) plus Supplementary Allowances. Post No. E.41

Applications are invited from suitably qualified persons for the post of Senior Computer Officer who will be responsible for co-ordinating the Computer activities in the various sections of the County Engineer's Department including the R.C.U. Sub-Unit and for programme developments and maintenance, data management and Education.

The appointment is on the permanent staff of the Warwickshire County Council and subject to the National Scheme of Conditions of Service as adopted by the County Council and to the Local Government Superannuation Acts. The appointment is also subject to the production of a satisfactory medical questionnaire.

Flexible working hours, staff restaurant and facilities, settling in allowance up to a maximum of £700 payable in appropriate cases.

Application forms are available from the County Engineer, P.O. Box 50, Shire Hall, Warwick, CV34 4RJ, to whom they should be returned by not later than Friday, May 26, 1978.

D. G. FULLER
County Secretary
Shire Hall, WARWICK

BARR AND STROUD

PROGRAMMER ANALYST

GLASGOW

We are a well established specialised engineering company with a wide range of precision, optical and electronic products.

We are looking for a Programmer/Analyst to work on Production Control and Bill of Material Systems. The work will involve collaboration in the design and programming of these systems or in the selection and implementation of appropriate packages.

Candidates should have some experience of Factory Control Systems a knowledge of RPG 11 and the ICL 2903 or 1900 is desirable.

Full details of age, education and experience should be submitted in writing to

The Personnel Manager
Barr & Stroud Limited
Anniesland Glasgow G13 1HZ

LONDON BOROUGH OF BARNET
Borough Treasurer's Department

PROGRAMMER

Salary Scale AP.1/5 — up to £4,900 p.a. (inclusive). Impending salary award from 1st July.

The Council operates an ICL 1903T computer running under George III (to be replaced by an ICL 2960 in September)

Applications are invited from Programmers with at least two years' experience in 1900 COBOL and/or PLAN

The successful applicant will be engaged in the development and maintenance of a wide range of applications including conversion to 2960.

Separation allowance payable up to six months or longer in exceptional cases, 100% of removal expenses, interest-free loans for the purchase of annual or six-monthly season tickets, additional leave at public bank holidays.

Application forms available from Room 46, Borough Treasurer's Department, Town Hall, Hendon, London NW4 4BG. Telephone number 01-202 8282, Ext. 120, quoting reference number 257. Closing date 22nd May, 1978.

University of Wales

UWIST

COMPUTER OFFICER

DEPARTMENT OF COMPUTING

with experience in the application of State-of-the-Art Methods and Techniques to assist research workers in the choice and application of statistical methods and computer packages.

Requests (quoting Ref. CW) for details and application form to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

Salary £3060 £6175

Closing Date 19 May 1978

Computer Operator/Programmers

£3282-£3622 p.a. inc.

(+ Phase III salary award, payable from July 1)

- *Bounds Green*
- *Cockfosters*

Two opportunities to become involved in setting up the reorganised computing service for Middlesex Polytechnic. The Polytechnic has a DECsystem 10 computer, and the Computer Operator/Programmers will join small teams responsible for remote access terminals at various Polytechnic sites in north London. While the main element of the post is operating activities opportunities will arise to train in and assist with programming.

You should have good relevant experience of computer operations work, preferably in an interactive environment, possess common sense and an accurate approach to work.

Telephone Gill Madden on 01-202 6845 for an informal discussion, or write for full details and an application form, quoting Ref. 113 1bB if you are interested in working at Bounds Green, Ref. 113 1aB for Cockfosters. Post your letter last class to Appointments Office (quote ref.), Middlesex Polytechnic, Bounds Green Road, London N11 2NQ. Closing date, May 15.

Middlesex Polytechnic

CONTRACT PROGRAMMER

RPG-II, N. LONDON TOP RATES

X-Calibur Computer Services
47 Essex Street, WC2
01-353 8201

COMPUTER AIDED DESIGN

DYNAMICS GROUP

are undertaking a major expansion in the area of Computer Aided Design.

The computer configuration comprises Prime 400 minis together with a dual ICL 1900 mainframe and to cope with the growth rate forecast, particularly in the areas of telatronics and VDU's, they require an additional Computer Aided Design Engineer to supplement their already highly professional team

It is hoped that applicants will have most of the following qualities

★ SOUND KNOWLEDGE OF FORTRAN
★ EXPERIENCE OF SYSTEM DESIGN
★ INVOLVEMENT WITH MINI COMPUTERS
★ KNOWLEDGE OF NOVEL TECHNIQUES, ALGORITHMS AND GRAPHICS
★ MAINFRAME EXPERIENCE USEFUL

The organisation is prepared to invest heavily in additional training and can offer first-class career opportunities.

The location is STEVENAGE (House full RELOCATION ASSISTANCE is offered if necessary. The salary will be HIGHLY COMPETITIVE and benefits include a good Pension Scheme, canteen facilities and full sports and social activities. Ref. WG 703

D.P RECRUITMENT LTD.,
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Come West and Live!

Salaries c £3.5k - £8k+

Vacancies exist for all levels of computer personnel in locations throughout the West Country.

Many of our clients are expanding and installing new equipment incorporating the latest techniques and providing excellent opportunities for career progression.

We need URGENTLY:
Analysts and Programmers with in-depth experience of PDP-11, using RSTS and BASIC+.
Exciting salaries and prospects with a young, dynamic company.

We also have requirements for:
Systems Analysts — all levels.
ICL Programmers — COBOL, PLAN
IBM Programmers — COBOL, PL1, ASSEMBLER
Technical Programmers — CORAL 66, FORTRAN

For further details in strict confidence write or telephone:

Walker-Weston Associates Limited,
Specialists in Computer Recruitment
Woodlands, Lower Bristol Road, Bath, Avon. Tel: Bath 317890

Leading French Bank requires a

PROGRAMMER

with at least 2 years' experience to help develop their Honeywell based real-time banking system. Previous experience in banking or with real-time systems would be an advantage and a mature attitude essential. Salary £4,000 to £5,000 or more depending on experience. Good staff benefits.

Write full details to:

Staff Manager
Banque De L'Indochine Et De Suez
62-64 Bishopsgate
London EC2N 4AR
or telephone Mr. J. Eley on 01-588 4941

PROGRAMMERS
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Abraxas Recruitment Division

ABRAXAS West End House, 11 Hills Place, London W1R 1AG **01-439 8891**

SOUTH HERTS/NORTH LONDON BORDER

If this is your part of the world (or an area you would like to relocate to), you will be interested to hear about current vacancies with our client, the head office computer centre of a major public company. The vacancies have come about as the result of some important new systems development projects including On-Line Sales & Marketing, Point of Sale Data Capture, Financial Database, Installation of Satellite Minicomputers and Extension to the Communications Network.

To cope with increased workload the company will shortly take delivery of a large IBM installation, which will run under MVS with the latest peripherals and mass storage devices.

During 1978, the company will require programming and systems staff at all levels. Job descriptions for several of the staff required are outlined below.

The company seeks enthusiastic and able professionals with experience gained on any IBM hardware, since full retraining will be given to all personnel during 1978/9.

Staff conditions include Relocation assistance where applicable, company car park, excellent staff restaurant, 36-hour week, pensions and sick pay schemes, free coach service and first-class social and sporting activities.

SYSTEMS ANALYSTS and PROGRAMMERS

SENIOR SYSTEMS ANALYST
£5,600-£6,500

An experienced person is required to lead the new development of a fixed assets accounting system. Suitable applicants will have a minimum of 3 years' analysis experience and whilst IBM knowledge is desirable it is not essential since full training will be provided.

SYSTEMS ANALYST
£4,900-£5,800

The first project will be to work with a team developing a Distribution system which will involve the use of Communications equipment. The suitable applicant should have a minimum of around 2 years' experience of Analysis/Design in a commercial environment. A programming background would be preferred but is not essential.

COBOL PROGRAMMER
£4,200-£5,800

To work initially on the development of a Stock Control and Forecasting system. This position would interest a Programmer or Senior Programmer with a background in COBOL. IBM experience would be preferred as would a knowledge of IMS Database techniques.

COBOL PROGRAMMER
£4,200-£5,800

The Person we are seeking will join a team working towards the implementation of a major accounting system. Applicants will have a minimum of 18 months' COBOL programming and experience on a large IBM mainframe using IMS would be an asset. All program development is being handled using video terminals under TSO.

INTERESTED? Contact SIMON BERRY at the above address/telephone number to receive full company information and application form. **N.B.** If you are interested but not ready to leave your present company, please inform me of your interest anyway.

Abraxas Computer Employment Ltd.

THORBAR

(RECRUITMENT AND CONSULTANCY SERVICES) LIMITED

Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

ESSEX

SENIOR ANALYST
PROGRAMMERS
ANALYST PROGRAMMERS

Salary to £7500

Salary to £5500

According to experience

CAREER PROGRESSION: PROGRAMMER — ANALYST PROGRAMMER SENIOR ANALYST PROGRAMMER — CONSULTANT

Do you fit into this career progression and are you looking for an opportunity with tremendous job interest. Our clients are a company with worldwide reputation and can offer application areas that involve database on-line real time processing.

They are looking for candidates with high or low level languages experience (at least 18 months). On the systems side an ability to 'live' with a project from feasibility to implementation.

Candidates with software experience, i.e. database or real time minis are especially sought after.

The appointments could turn out to be a real opportunity. Relocation expenses will be met by candidates willing to make a move from the north south or west.

PLEASE RING IMMEDIATELY FOR FURTHER DETAILS.

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

PROGS and ANALYSTS — *where are* you?

Contact us. We have the widest choice of career opportunities throughout the U.K. and abroad, offering excellent salaries and prospects. Whatever the field or language, we can help.

Here is just a small selection:

MIDDLE EAST

Programmer: RPG 11, 370/115 — to $18,000 U.S.

LONDON

Trainee Programmer: Degree level — to 4½K
Programmer: COBOL Insurance and Banking — to 5½K
Analyst: Inurance and Banking — to 7K

GLOUCESTER

Programmer: Software Spec. — to 6K

BIRMINGHAM

Analyst / Programmer — to 5½K

LEEDS

Jnr. Analyst — to 5K

For a confidential chat about these positions or for professional advice on your next move

Contact Tony McGrath

CUSTOMER ENGINEERS
LONDON & W COUNTRY
£6-8K package

Experienced mini and mainframe engineers can take a big step forward by joining this world renowned international manufacturer.

As a member of a strong team of professionals within a multi-national organisation, your career prospects would be excellent with full training given on company products. A regular review of ability and salary provides an incentive, and ensures that effort and talent are realistically rewarded.

The main responsibility of these positions is the maintenance of various computer systems and their associated peripherals to provide the reliable and efficient service for which the company is well known. Engineers concerned with large mainframe systems will be resident on site whereas those servicing smaller systems will be mobile. To be capable of these demanding roles you will need to have had at least four years' mainframe or two years mini computer and peripheral maintenance experience and have the ability to communicate with customers at all levels.

Excellent benefits are given by this international company. If a challenging position offering substantial rewards interests you —

Contact Peter Gorton

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

JBA

Systems Analyst

Schlumberger

London — **up to £7,000**

Our client, part of the international Schlumberger Group who specialise in services to the oil and exploration industry, have an opportunity for a Systems Analyst to join a well established development team.
Applicants should have had about five years in data processing with the early part spent as a programmer preferably in an IBM installation. Experience with users and in the design of commercial applications is essential.
Salary according to experience. Generous fringe benefits including L.V.'s International travel.

Contact: Jim Baker

*System Support Analysts †Development Programmers

***North of Birmingham & †Dorset** — **to £6,000 + car**

An export award-winning manufacturer of data-entry systems have opportunities for graduate programmers to contribute to major development projects. Applicants must have at least 18 months mini/micro application experience gained preferably in a technical environment. Commercially minded analysts will be involved with customers, identifying problems and be responsible for resolving them quickly and effectively.
These positions are well rewarded and offer a challenge to professionals wishing to enhance their expertise.

Contact: Margaret Stevens

Systems Analyst

Midlands — **c. £6,000**

A large international engineering organisation has an immediate vacancy for a Systems Analyst to work on the development of financial and manufacturing applications. Candidates should have at least two years in the design of commercial systems preferably with real-time or on-line techniques.
A sound IBM programming background would be an advantage. The company are looking for a person with potential who will be able to take more responsibility in the near future.
Excellent salaries and usual large company benefits. Relocation expenses.

Contact: Jim Baker

HOLLAND

Technical Authors — up to £12,000+

Applications software, data communications, or digital electronics. Any of these skills plus a flair for writing will be of interest to our clients.

Contact: Mike Creamer

MIDDLE EAST

Programmer to Project Leaders — up to £15,000 (Net)

A variety of long-term and very interesting positions for, basically, sound IBM professionals with commercial experience. All positions are married accompanied (pref no children) and all housing is free. If you are interested, whatever your experience, we'd like to hear from you.

Contact: Mike Creamer

Analyst/Programmers

Coventry — **c. £5,500**

Our client, a well known manufacturing company, is looking for several Analyst/Programmers to join their expanding development teams. Several years as a COBOL programmer is essential together with experience in the design of at least one commercial application.
Above average salaries and opportunities. Generous benefits, ncluding assistance with relocation.

Contact: Jim Baker

Technical Advisors

Herts — **to £5,400 + car allowance**

Excellent opportunities have arisen with a small business systems manufacturer for experienced software/commercial support persons to provide liaison and technical aid to a wide ranging customer base. Candidates should have a minimum of one years' implementation or post sales support experience of small commercial computer systems.
Since the key function is client liaison appointees will be personable individuals with the ability to communicate effectively with technical managers.
A substantial starting salary will be paid to attract high calibre people.

Contact: Margaret Stevens

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

If our terminals are so good why do our salesmen have to be so good to sell them?

Because the market we've chosen is big, expanding . . . and tough. Raytheon Cossor's terminal systems are sophisticated, designed for the most demanding computer users. To demonstrate the improvements they can bring to an installation requires a thorough understanding of the client's environment. And since many of our users operate IBM mainframes, IBM itself is one of our prime competitors. That alone means our sales executives have to be rather special.

Their success so far can be judged by the programmable PTS 100. It has become one of the world's most widely-used display terminals, with over 50,000 installed and the number still growing. Now we have the new PTS 1200 distributed processing system. And we need further senior sales staff to help repeat the success of the PTS 100, on which it is based.

Sales Executives

Candidates will have sound D.P. backgrounds and a proven record in selling computer equipment to large industrial and commercial organisations. They will have experience of transaction systems including order processing and, ideally, of distributed processing. We are especially interested in knowledge of banking, insurance, airlines and the distribution industries.

Vacancies exist in the South-East, based at Harlow, in the Midlands, based at Birmingham, and in Manchester, for the North of England and Scotland.

Salary and commission should give annual earnings of £10,000 plus. A car will be provided.

OEM Sales Manager

A growing number of independent suppliers are incorporating Raytheon Cossor hardware in their systems. We are creating the new post of OEM Sales Manager to develop this business into a significant outlet for PTS equipment. Existing clients are in the U.K., Norway and Denmark. Extensive travel in these and other European countries is envisaged.

Candidates must have knowledge of mainframes, minicomputers and programmable terminals. They must know the OEM business thoroughly, from either the selling or buying side. They will have the energy and initiative to develop, then follow through, sales strategies appropriate to the PTS range.

Initially, salary and commission should provide annual earnings of at least £11,000. A car will be provided.

Write giving brief career details or telephone for an application form to:
W. D. Barrow, Raytheon Cossor Data Systems, The Pinnacles, Harlow, Essex CM19 5BB. Telephone: (0279) 26862

Raytheon Cossor Data Systems

We're big enough to have the contacts; small enough to care about you

The many permanent vacancies we have on our register include:

1. BUSINESS SYSTEM SALESMEN, preferably with some systems background. Based Croydon, basic salary + expenses + company car + realistic commission structure means your first year's earnings are in excess of £10K. **Ref: IC/190**
2. COBOL PROGRAMMERS (2 years' experience) — £4.2K. LEAD PROGRAMMERS (3 years' experience) — £5.6K, SENIOR PROGRAMMERS (4 years' experience) — £6K; for City-based multi-national group using IBM 370 under DOS. **Ref: EL/171**
3. REAL TIME PROGRAMMERS, minimum 18 months' experience. Data General (pref); Fortran and/or Assembler would help. £6K + all the perks of a rapidly expanding young company in West London. **Ref: KG/231**
4. **THIS WEEK'S FEATURED JOB:**
   DP MANAGERSHIP awaits System 3 RPG II ANALYST PROGRAMMER. After initial trial period promotion to DPM will qualify for a salary of £6K+. Outstanding opportunity! London W1. Ref: CK/169
5. ANALYST AND/OR ANALYST PROGRAMMERS with minimum of 4 years' experience any machine any language. WE ARE IN CONTACT WITH SOFTWARE HOUSES, LARGE MULTINATIONAL ORGANISATIONS, AND SMALL DP DEPARTMENTS. They all need you desperately! So call us now.

FREELANCERS
CONTRACTS EVERYWHERE. IMMEDIATE STARTS, LONG TERM (UP TO A YEAR) AND SHORT TERM (3 MONTHS). OUR RATES ARE RIDICULOUSLY GENEROUS! WE ALSO HAVE TOP-CLASS CONTRACTS PLANNED TO START OVER THE NEXT 3 MONTHS! — SO GET YOUR NAME ON OUR REGISTER, EVEN IF YOU'RE NOT IMMEDIATELY AVAILABLE.

THINKING OF TURNING FREELANCE? THERE'S NO RISK WITH US. WE OFFER SECURITY, CONTINUITY, TAX ADVICE AND TOP MONEY. CALL US WITHOUT OBLIGATION, NOW!

IT DOESN'T MATTER IF YOU DON'T FANCY THE ABOVE VACANCIES, WE'LL GO OUT OF OUR WAY TO FIND YOU SOMETHING THAT SUITS YOU. EVEN IF YOU'RE NOT THINKING OF CHANGING JOBS JUST YET, FILL IN THE COUPON AND GET YOUR NAME ON OUR REGISTER. THAT WAY YOU COULD WELL FIND THAT EXTRA SPECIAL JOB WITHOUT EVEN TRYING.

Give IAN COX a ring on: 01-637 0105 during weekdays, or 01-272 2794 in the evenings or at weekends, or fill in and send us the coupon below.

NAME _____ TEL. (HOME) _____
ADDRESS _____ (OFFICE) _____
_____
CURRENT POSITION _____ SALARY _____
POSITION REQUIRED _____ SALARY REQD. _____
LOCATION/AREA IN WHICH YOU WISH TO WORK _____
PAST EXPERIENCE _____
MACHINES _____
OP. SYSTEMS _____
LANGUAGES _____
APPLICATIONS _____
YEARS EXPERIENCE IN DP _____

TO FREEPOST 26 ACS LTD., ACS HOUSE, 42-48 GT. PORTLAND ST., LONDON W1
TELEPHONE 01-637 0105 or 272 2794 Evenings/Weekends

Applied Computing and Software Limited **ACS**

ACS House, 42-48 Great Portland Street, London W1N 5AP

Central Computing Consultants

Production Analyst

Berkshire **£ neg.**

A major manufacturing company based in Berkshire is embarking on a development programme involving the addition of an ICL 2900 to their current 1900 installation.

In line with this development, they wish to recruit an experienced Systems Analyst to design and implement a large production system over the next 2-4 years. Suitable candidates must have experience in productions systems and have seen one project through to implementation.

The company offer excellent career opportunities in addition to employment benefits.

CW/1

IMS - TSO - MVS Programmers

£4200-£7200

One of the country's leading retail companies have committed themselves to an exciting and ambitious expansion programme. They require experienced PROGRAMMERS at all levels to help implement new systems. Therefore if you have experience of IMS, TSO, MVS we would like to hear from you!!

The company can offer the usual large company benefits and the opportunity of working in one of the most advanced installations in the country.

CW/2

Banking & Mini Computers

Programmers up to £5K

Consultants up to £9K

The banking division of a major U.K. Systems House is looking for staff to meet the needs of their clients. Particular requirements are.

★ People with experience of banking systems ranging from programmers with 12 months' experience through to consultants with 7 years' plus experience.

★ Mini Computer specialists with 1-5 years' experience to join a team working on the applications software for international distributed processing systems. Knowledge of DEC computers or RTL2.

★ Programmers and Senior Programmers with experience of RPG.

This is an exciting opportunity to join a group which is growing rapidly and where the development of your career depends only on your abilities.

CW/3

RPG II or COBOL Programmers

Southern Ireland

Our client, a manufacturing company accessible to Dublin, requires experienced programmers for their up-to-date installation.

Currently programmes are being written in RPGII, but our client requires a minimum of 2½ years' programming experience in either RPGII or COBOL. Applicants will be given training where necessary. Systems experience awaits the successful programmer who has a good commercial manufacturing background.

The company offers these outstanding opportunities to secure very interesting work with great scope for the successful candidates who have the initiative to progress within an expanding organisation. In addition to a competitive salary and excellent working conditions on a new installation, there is a life assurance and pension scheme. Assistance will be given with relocation costs where applicable.

CW/4

PROGRAMMERS & ANALYSTS

£4.5K - £8K

Consider the benefits of

★ Working in West London
★ Working on communications systems
★ Progression to project leadership
★ Variety of job contact
★ Programme development through VDU's

If you are a programmer or an analyst and have had exposure to commercial applications (on any hardware), our client would be very interested to learn more about you and discuss your future. They are a well-established software house and offer a career path based on real time earning above average salaries and large company benefits.

Projects are divided into small teams and there are many opportunities for men and women with management potential to gain experience in project leadership at a very early stage.

CW/5

Operating Systems Support

1900-2900

Our clients, based in Slough, are installing a 2950 in addition to their present 1900. They currently use George II + and the 2950 will initially run under DME, progressing to VME/K

In light of this expansion they require someone to take responsibility for the operating systems reporting to the Senior Systems Programmer

The successful candidate can have a background either in programming or operating but must have worked on George II, George III and 1900's.

The company is offering a very good career opportunity plus excellent company benefits.

CW/6.

Cobol Programmers

London

A major international company situated in London require PROGRAMMERS for their London office.

The installation, an IBM 370, is shortly to be upgraded to cope with the demand from international and local users.

We would like to hear from programmers who have the following experience.

★ 2 years' IBM COBOL
★ Knowledge of DOS/VS
★ Knowledge of VSAM

Future projects are all T.P. based with the introduction of Database techniques, which will offer you a challenging and rewarding future. Salaries are negotiable but will not be less than you would expect for your experience.

CW/7

1900 COBOL

London **c. £5K + mortgage scheme**

We have been retained by our client, a large multi-national insurance company, to recruit a number of PROGRAMMERS for their offices in EC2.

Candidates will have at least 18 months' experience on 1900 systems under George 1+, and will have worked on a variety of commercial and financial systems. Direct experience of assurance application would be advantageous.

The company offer excellent prospects to the right people, which includes a mortgage scheme.

CW/8

Mini Expertise

A major Software House based in the Midlands have vacancies for PROGRAMMERS and SENIOR PROGRAMMERS in their Special System Division

Candidates will have expertise in real time processing, process control or data acquisition and with skills on a high level technical language or Assembler. Experience in DEC operating systems is preferred but not essential.

Also they have vacancies for people with experience in communications, database and commercial programming languages.

The company offer the usual benefits and salaries will not be a problem to the right people.

CW/9

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212 (24 hours) Telex 27950

DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 762170/762188/785692 Telex 30742

CCC

Computing Services Association

GHANA
SYSTEMS ANALYST

Ashanti Goldfields Corporation (Ghana) Ltd.

A vacancy exists for a Systems Analyst with in-depth knowledge and extensive practical experience of Systems Design and Programming in Plan for Disk and I.C.L. 1900 Driver. This appointment will involve:

Preparation of detailed systems and programming specifications

Guidance, advice and counsel to programming staff

Training of local staff in practical systems design and analysis

The installation comprises an I.C.L. 1901T Computer, 48K., with E.D.S.60 and local visual display terminals with termiprinters. The successful applicant will head the project to redesign existing magnetic tape systems to operate effectively in a disk and communications environment. Ideally, past experience will have been gained in a small installation where the applicant has been fully involved at all stages of the systems, programming and operational implementation. Experience of working overseas and possession of formal computing qualifications will be an advantage.

Starting salary about £11,000 p.a. (equivalent) at present rate of exchange.

Conditions of service are in line with modern thinking and include:

5 year contract
16 month foreign tours with 3 months' leave
Free furnished accommodation
Family passages each tour
Provident, gratuity and life assurance schemes
Staff primary school/education allowances
Good sporting facilities

Please write in confidence to: –
A. Orchard, Group Personnel Manager,
LONRHO LIMITED,
Cheapside House, 138 Cheapside, London, EC2V 6BL.

You are a

COBOL

Programmer,
You want to work on new

DATABASE & REAL TIME

applications on

ICL 2980

in

LONDON W1

and earn up to

£5600

You should have had upwards of two years' programming experience on ANY MAINFRAME, including sound COBOL

We are recruiting for clients — a major West End installation, who offer a good career path and appropriate retraining.

Please ring us for a confidential exchange of information, quoting ref. 686. Alternatively, leave a message on our answering machine after hours or write briefly.

Tel: 01-637 5796

EDP Systems
52-53 Margaret Street
London W1N 7FF

SCHREIBER

the largest and most progressive furniture manufacturer in the U.K. is seeking a

COMPUTER PROGRAMMER

to join a team engaged on commercial systems and based at Harlow, Essex.

Equipment currently in use includes:
Dual 2903/2904 Processors
EDS 60 Drives
Local and Remote Communications

Languages used:
COBOL
RPG II

The Company offers:
An attractive and competitive salary
Profit sharing
Pension Scheme
Free Life Assurance
Generous relocation assistance

Please apply in writing giving career details to:
Melvyn Seymour
Schreiber Furniture Limited
Edinburgh Way
Harlow, Essex

UNIVERSITY OF STRATHCLYDE COMPUTER CENTRE

CHIEF COMPUTER OPERATOR

Applications are invited for a second Chief Computer Operator post in the Computer Centre. The successful candidate will be concerned with the new Honeywell 6060 soon to be installed in the University and will eventually become involved in the large Network section which already exists in the Computer Centre.

The Universities of Strathclyde, Edinburgh and Glasgow are linked by 50Kb communications lines with Node Processor in each site. Computer systems available through the Network include local systems DCL 1904S, C.T.L. Front End Processor, Honeywell 6060, ICL 2980 and 2970 systems in Glasgow and Edinburgh and I.B.M. at Newcastle.

Candidates are expected to have several years' operating experience as a Shift Leader. Knowledge of Honeywell systems operating under G.C.O.S., and experience of commercial systems, will be an advantage.

Salary Scale (including all supplements): £4065-£4162 per annum (under review).

Applications in writing, QUOTING REFERENCE CC.7, giving details of age, experience and qualifications, should be made to: The Personnel Officer, University of Strathclyde, Royal College Building, 204 George Street, Glasgow G1 1XW.

WANTED

TRAINEE SALES POSITION

For presentable, amiable young men, aged 25 with professional and realistic approach. 5 years' Operations experience in commercial and public service systems. Free time on block to attract training/assessment.

Box 1958
Computer Weekly

UP TO 100% RELOCATION COSTS

SENIOR ANALYSTS - ANALYSTS - PROGRAMMERS

Our clients who are the largest Honeywell users in the U.K. have requirements for a number of trained Programmers and Systems Analysts in the Liverpool area.

They are increasing the D.P. department to cater for the major expansion which is taking place in their Computer resources and development plans during 1978.

Apart from the usual large company benefits they offer up to 100% relocation costs for people who are able to undertake these positions.

Gryphon Computer Recruitment
Essex House, Cherrydown, Basildon, Essex.
Contact Chris or Olivia on 0268 282155

METROPOLITAN BOROUGH OF
Rochdale

Treasurer's Department

PROGRAMMER

(Computer Section) AP.2/3
£2,983/£3,773

The present installation comprises an ICL 64K 1902T with tapes and disc and communications equipment which will be replaced by an ICL 2980 system later this year. Substantial development of on-line systems is planned. A knowledge of 1900 Cobol is desirable.

Application forms available (by quoting Ref. No. S.571) from the Chief Personnel Officer, 168 Drake Street, Rochdale OL16 1XG, to whom they should be returned by 18th May, 1978.

Analyst/ Programmer up to £7,500

Small, lively systems house with work mostly in and around London and S.E. require an experienced Analyst/Programmer to design and implement cost-time business systems on leading mini-computer hardware. One high level language required.

Contact: Tony Simpson,
General Business Systems,
01-398 7236.

Leicester Polytechnic
COMPUTER CENTRE
(User Support Section)

SENIOR PROGRAMMER/ ANALYST

This is a challenging post. The person appointed will be expected to be capable of leading projects on a variety of computer systems. The prime responsibilities will be to cater for the needs of the Art and Design and Science Faculties.

The person likely to be appointed will be of graduate calibre with at least two years' relevant experience.

Salary £3826-£4545 plus pay supplements of £519 p.a.

PROGRAMMER

This post will provide the opportunity to work on a wide range of application programs. Applicants should be suitably qualified and experienced.

Salary £2629-£3282 plus supplements of between £454-£492 p.a.

Further details and application form available from Staffing Officer, Leicester Polytechnic, P.O. Box 143, Leicester LE1 9BH. Tel: (0533) 50181 Extn. 2301.

DEPARTMENT OF ENGINEERING

Senior Engineering Analyst/Programmer

Post Ref. E2111
Grade SO1/2, Salary £4759-£5512 inclusive of supplements

This post within the Computer Section of the Department of Engineering is based in County Hall, Barnsley. The successful applicant will be required to head a small team of Analyst Programmers on technical and information systems for the Department. The Council operates a 192K ICL 1904S computer accessed by terminals and a computer graphics work-station.

Applicants should possess a degree in a technical subject or an equivalent professional qualification together with sound programming experience ideally on technical applications. ICL George 3 experience is preferred but the necessary conversion training will be provided.

Please write or telephone for an application form quoting the appropriate post reference to the Chief Executive (Personnel), South Yorkshire County Council, County Hall, Barnsley S70 2TN, or telephone Barnsley (0226) 85141 Ext. 266.

Closing date for applications will be 19th May, 1978.

South Yorkshire County Council
ENERGY IN ACTION

THE SALES BIT

Three types of reference-sells

EVERY salesman has a number of clients who are completely satisfied with the product they have purchased. His colleagues will also have similar clients, so that their company as a whole will have a broad selection of happy users involving a variety of industries and company sizes. These companies represent the most effective selling device the salesman can use. Namely, the reference-sell.

The main condition an effective reference-sell must fulfil is that it is relevant. There is no point in taking a client to a prestigious account like Rolls-Royce, to view the mammoth computer-hall and soak up the reflected glory, when your prospect is really interested in stock-control for wholesale greengrocery — unless, of course, he has a sideline in RB211s.

If reference-selling is to be truly effective, it needs to be organised at the company level. An audited analysis of satisfied clients by application, industry, company size, equipment type and location is generated and held by a responsible senior executive, such as the marketing manager, who supplies truly relevant references on application by the salesman concerned.

Unfortunately, the general distribution of such a list would represent an unnecessary risk in the context of competitive information, so it is important for responsibility to be in the hands of one senior person.

Of equal importance to the relevance of a reference-sell is the client's willingness to be a referee. Some companies simply do not want to be bothered, and their wishes need to be respected. In addition, it is important that contact by an off-territory salesman does not create problems for the salesman responsible for the client concerned. Therefore, reference-sells must be continually evaluated for their current willingness to participate, their present level of satisfaction and their availability in terms of a particular intended visit.

There are three types of reference-sells: telephone, letter, and personal visit of which the latter tends to be the most powerful.

While such visits should always involve the salesman concerned, it must be remembered that the lower the profile he takes the greater the credibility of the reference-sell. The salesman is merely the courier in such an event and must leave the prospect and the client to their own particular truths without the distraction of a biased prompter. After all, the existing user is only going to say good things about you if your reference-sell list is as reliable as I have already stated. Besides which an existing user will normally be eager to reaffirm the wisdom of his original choice.

Another important point about reference-clients is that their hospitality must never be abused. No matter how tolerant your contact might be, how relevant the application or significant the client's market stature, it is easy to overstay your welcome. It is also important that you let your existing client know that you appreciate his willingness to help you make another sale. So be sure to write and tell him soon after the visit is made.

If, then, we can assume that the reference-selling within the salesman's company is being organised effectively, we need now to relate this to the process of closing the sale.

The inclusion of a list of reference-clients within the formal proposal is a fairly common practice. This, in fact, is a complete waste of time unless the names involved are those of companies and applications which have been visited and/or discussed in detail so that their relevance to the client is beyond question.

Having said that, most prospective clients will not take up your offer of a client visit or even bother to contact by letter or telephone. In such circumstances the reference-sell is often a useful device for securing a decision from an indecisive prospect.

When a buyer is dithering about making a decision, it is because he is insecure due to a situation which is outside his repertoire of experience. The best way to help him out is to put him in touch with someone who has handled a similar situation. Once he knows his dilemma is not unique he will feel much happier about committing himself.

More often than not, the buyer will either take up the offer and get the necessary assurance, or simply take the salesman's word for it and place the order.

Don't forget, a satisfied client is a company's best salesman.

TRADE

RESTAURANT accounting, the application area for the A Documentor 3220D system from Addressograph Multigraph. This comprises a master video terminal that can operate in standalone mode, which can be linked up to fi remote terminals in a network.

The 3220D can be used to store menu items and prices, calculate taxes, account for cash, maintain an inventory and monitor employee timekeeping. The master terminal can also interface with a tab printer for writing bills.

An alternative system to the 3220D is the 3206 where a master terminal is linked to up to five remote scanner terminals. These can read off information from pencil marks on pre-printed menu forms. Addressograph-Multigraph (CW), PO Box 17, Mayflower Avenue, Hemel Hempstead, HP2 7ET. Tel. Hemel Hempstead (0442) 2251.

Puzzle answer

THE three intervals, between the four figures—not obviously be exactly divisible by the mystery number and so must the two intervals between the first three intervals (both of which total 46). Then, since the four figures are mixed up and even, the divisor has to be odd if the remainder is constant. The only factors of 46 are 2 and 23, so 23 is the required divisor.

VIDECOM
(Henley-on-Thames)

VIDECOM LTD are manufacturers of the world's first multi-host computer terminal facility with an installed base worldwide

Due to continued rapid expansion we urgently require experienced

PROGRAMMERS

Experience in Assembler level and minicomputer programming preferred and evidence of successful programming is needed for senior posts

Based at the Company's Headquarters at Henley-on-Thames, these posts offer a unique opportunity to work on design and development of software for this exciting new communications equipment and offer excellent career advancement prospects.

Salary is negotiable, depending upon background and experience and conditions include all benefits normally associated with a successful international company.

Write, giving brief career details including present salary, to Miss H. Barker.

VIDECOM LIMITED

NEWTOWN ESTATE
READING ROAD
HENLEY-ON-THAMES
OXON, RG9 1HG

PROGRAMMERS — ANALYSTS READ ON

START
IF PROGRAMMER GO TO A
IF ANALYST GO TO B
GO TO C

A. ★ ★ PROGRAMMERS ★ ★

If you are a programmer with at least 18 months' experience in COBOL RPG or FORTRAN then we have top positions for most systems in most areas.

B. ★ ★ ANALYSTS ★ ★

Urgently required — Min 18 months' commercial systems. Vacancies throughout U.K.

C.

Many other positions available throughout the U.K. for experienced staff.

GRYPHON

Gryphon Computer Recruitment —
Essex House, Cherrydown, Basildon, Essex
Contact Chris or Olivia on 0268 282155

OPPORTUNITIES IN GERMANY

A major software house with offices in Munich and Cologne has retained us to recruit for their next phase of expansion.

They look for co-workers with alert and creative minds and willing to co-operate in maintaining a tension free environment.

The applicants must have some knowledge of German and good professional skills within the range of the following fields.

Process Applications, Mini-Computers, Systems Programming, Organisational DP consultancy, Application programming and DP experience especially in IBM, OS/DOS, MINI COMPUTERS and TP, ASS. PL/1, COBOL DBOMP, and DB.

Female applicants are welcome.

Salaries from £9,000-£15,000 p.a. 5 weeks' annual holiday, assistance with relocation.

Application should be addressed to

Shaun de Warren, CHARTERPORT Ltd., 10 Lefroy Road, London, W.12.

COLUMBUS DIXON

Manufacturers of Floor Maintenance Machines and Chemical Products

Columbus Dixon Limited
Lancelot Road Wembley England HA0 2BH
Telephone 01-903 6001 Telex 2-2500

NEAT/3 PROGRAMMER

We are a light engineering Company presently using an NCR Century 100 but with imminent plans to upgrade.

We are seeking an experienced Programmer wishing to convert to COBOL later in the year. Salary Neg.

Please write or phone:
Mr. Johnston, Personnel Officer

West Yorkshire Metropolitan County Council
Traffic Unit

SENIOR TECHNICIAN/PROGRAMMER

T3 or T4 £2623-£3282 or £3282-£3762 plus up to a maximum of £520 supplement

To assist in the preparation of programs which will be used in the computer based West Yorkshire Urban Traffic Control scheme now being installed in Leeds. Based at Bridlington House, Leeds.

HND or similar qualification in an appropriate engineering or computing subject preferred. Training will be given if considered necessary.

Application forms may be obtained from: Director of Planning, Environmental Protection and Transportation, Room 238, County Hall, Wakefield, to be returned by 22nd May, 1978.

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

APPLICATIONS CONSULTANTS

CITY & WEST LONDON **To £7500 + +**

Due to the continued growth, in England, of this major U.S. Bureau several vacancies now exist for Applications Consultants. The Company market a range of powerful software products for use primarily as management aids. Based at either their City or West London offices applicants will receive thorough training before being given responsibility for client accounts and advising the marketing team in preparation of business proposals.

Ideally, applicants will have a technical background with a minimum of five years' commercial experience. Previous analysis involvement is not essential although appreciation of business issues would be an advantage.

The Company offers an excellent basic salary plus car allowance and bonuses geared to both individual and team performance. Career prospects are particularly attractive and applicants may look to progress into management.

24-hour answering service

Please telephone for a confidential discussion or write to:
30 Fleet Street, London EC4Y 1AA
01-353 0981

GROWTH

OPERATORS & SENIOR OPERATORS

BEDS.
Up to £4650 plus overtime

ICL 1900 & 2900 Installation

Due to exceptional growth our client will be installing an ICL 2960 System in August to operate alongside a 192K 1903T. This means new opportunities and first-class career development prospects for ambitious young operators.

The operating system is George 1 + which will also be run on the 2960 using D.M.E. MAXIMOP & DATAVIEW are supported for terminal users during the daytime.

A three shift system operates during the week with ample opportunities for overtime during the weekend.

THE COMPANY

Our client is a medium-sized engineering company employing 2,000 people. They have modern premises in rural Bedfordshire, not far from the M1 Motorway and easily accessible from population centres, such as Luton and Bedford. Housing is attractive and plentiful in the area and the company will provide generous assistance with relocation costs where appropriate.

To apply for these positions please telephone Sylvia Walton or write to:

Castle Computer Services Limited
211 High Street, Berkhamsted, Herts. HP4 1BW. Phone: (04427) 73181

CONTRACTS

Systems/Analyst

We require a Systems Analyst with a minimum of 2 to 3 years' experience on ILC equipment. Ideally we are looking for someone with 2904 & IDMS experience but our Client would be willing to take someone with sound 1900 experience who has implemented a medium size system from start to finish. This contract is to commence at the beginning of June for a minimum duration of 5 months.

PL/1 Programmers

Required for our City based Clients. Contracts are scheduled to start beginning of May & June and are for a minimum duration of 9 months.

For further details please contact Bridget Kotchie

RENDECK LIMITED
10 Dover Street
London W1X 3PH
Tel: 01-629 5438

Rendeck

IMPERIAL COLLEGE
Department of Computing and Control

SENIOR COMPUTER OPERATORS (2)

Starting salary within the range £2193-£2769 [illegible]

Applicants should have had at least 2 years experience [illegible]

TRAINEE COMPUTER OPERATOR

Starting salary within the range £2193-£2769 [illegible]

Applicants should be of good attainment and at least 17 years of age

We operate an IBM 370/135 running under VM/370 primarily for the provision of computer services to students of computing science. Full [illegible] will be given to applicants with VM experience

Two shift system. 07.30-23.00 Monday to Friday. [illegible]

Please write, giving details to: Mrs L. M. Moore, Imperial College, Department of Computing and Control, 180 Queens Gate, London, S.W.7.

COMPUTER ENGINEERS

c. £5500 + CAR
BIRMINGHAM & MANCHESTER

Our client is a leading American computer manufacturer who seeks a SENIOR ENGINEER to establish a base in the MIDLANDS, and an additional engineer for the Manchester area.

Both vacancies will appeal to Customer Service Engineers with at least three years' experience.

THESE POSITIONS OFFER OUTSTANDING GROWTH POTENTIAL.

For further details ring us quoting ref. 611.

Tel 01-637 5796

EDP Systems
52-53 Margaret Street
London W1N 7FF

COMPUTING MANAGER

REED & SHEPHERD LTD. OF SOUTH WALES

A long established [illegible] engineering company, total Swansea [illegible] employing 1,8 M. System/32 Computer mainframe.

The Computer Systems are being developed for many aspects of our manufacturing and administrative functions, which include up to 1000 people.

We require a B.S.C. or Engineering graduate with experience of IBM systems/3 or System/32 experience in production or Computing Manager.

Full salaries [illegible] and a car are offered plus the usual fringe benefits.

Write giving details of experience to:
[illegible]

Electronic Technician

Computer and Data Terminal Repair

Texas Instruments is a world leader in the highly competitive electronics market. We seek an ambitious young person, who has obtained ONC or equivalent, to undertake the test and repair of computer and data terminals at our headquarters in Bedford.

We offer an attractive salary and excellent benefits including assistance with relocation expenses where applicable.

Please write to or ring Beryl Harris, Texas Instruments Ltd., Manton Lane, Bedford. Tel. Bedford (0234) 67466.

TEXAS INSTRUMENTS LIMITED

Line Controller

c. £4250 +
Substantial Fringe Benefits
BEXLEYHEATH, N.W. KENT

The Woolwich, which is one of the country's largest building societies is enhancing its teleprocessing system to support its branches throughout the U.K.

The Society wishes to recruit a Line Controller who will assist in the operational running of what will ultimately be a large IBM based data communications network.

Candidates should preferably be educated to "A" level, although good "O" or CSE levels will be acceptable. Previous experience of controlling a data communications network is essential.

A comprehensive remuneration package accompanies this position including a preferential mortgage facility and excellent pension scheme. Relocation expenses may be paid where necessary.

Write or telephone for an application form to: Mr. H. C. Watling, Personnel Officer, Woolwich Equitable Building Society, 30 Erith Road, Bexleyheath, Kent, DA7 6BP. Tel. Crayford 526232, ext. 404.

WOOLWICH
EQUITABLE BUILDING SOCIETY

STAVELEY COMPUTING CENTRE
Blackpole Road, Worcester

OPERATIONS MANAGER

required for busy IBM/DEC BUREAU

Salary £7K,
Use of Company Car

Apply to: The Managing Director
Telephone: Worcester 53335

Teesside Polytechnic

RESEARCH ASSISTANT IN COMPUTER SCIENCE

Applications are invited from suitably qualified graduates for the post of Research Assistant.

The research topic is design and implementation of systems for testing job development.

The successful candidate would be expected to register for a higher degree with the CNAA and also undertake some teaching duties.

The post is tenable for three years and attracts a starting salary of £2,930 per annum with annual increments of £101.

Application forms and further information are available from the Staffing Section, Teesside Polytechnic, Borough Road, Middlesbrough, TS1 3BA, and are returnable within 14 days of the appearance of this advertisement.

CONTRACTS HOLLAND

Systems Programmer **£1900 p.a.**

We require someone with considerable experience on IBM 370 series with VM, OS/VS1 & DL1 to be based in AMSTERDAM for a duration of 1 year.

Systems Programmer **£350 p.w.**

With IBM background and OS/VS1 experience to work in AMSTERDAM for 6 months.

ITALY

Programmer

With a minimum of 2/3 years' PL/1 and CICS experience. For a 3 month contract starting May 8th.

For further details please contact Bridget Kotchie

RENDECK LIMITED
10 Dover Street
London W1X 3PH
Tel: 01-629 5438

Rendeck

CONTRACT PROGRAMMER

COBOL/DOS/DL1
SOUTH ENGLAND
TOP RATES

X-Calibur Computer Services
47 Essex Street, WC2
01-353 8201

VIDECOM (READING)

VIDECOM LTD are manufacturers of the world's first multi-host computer terminal system with a worldwide installed base.

Due to continued rapid expansion we urgently require two experienced

TEST ENGINEERS

Experience in TTL and micro logic systems is essential though full training will be given on all VIDECOM products.

Based at the Company's attractive new facility at Reading, these posts offer a unique opportunity to work on this revolutionary new communications concept and offer excellent career advancement prospects.

Salary is negotiable, depending upon background and experience and conditions include all the benefits normally associated with a successful international company.

Write, giving brief career details including present salary, to Miss H. Barker.

VIDECOM LIMITED

NEWTOWN INDUSTRIAL ESTATE
READING ROAD
HENLEY-ON-THAMES
OXON, RG9 1HG

OPERATORS

FIVE IBM 370/148 DOS VS/GRASP VS OPERATORS

A great future holding the promise of rapid progress into Programming and Technical support awaits you in Central London. If you have at least 6 months' experience, you can expect a salary to.

£3800

FOUR IBM SYSTEM 3/15 OPERATORS

If you have 1 yr+ experience, you're needed for this rapidly expanding City installation. 4 weeks' hols, generous LVs and promotion prospects.

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Further particulars may be obtained quoting reference L 42/A from the Establishment Officer, University House, Bailrigg, Lancaster LA1 4YW, to whom applications (6 copies) stating three referees should be sent not later than 9 June, 1978.

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The Hexadecimal Kids
...and his faithful dog Ascii

A fantasy in 16 bits by Richard Forsyth

BIT 16 (THE PARITY BIT)

AFTER a traumatic night, Hex has left Base 16 to seek Ascii, whose distress call he has picked up by radio. He makes his way to Silicon Valley once more, where he is confronted by a scene of devastation. All the humans in the reservation have been killed by the neutron grenades of the Night Operators – all, that is, except Dr Null who lies mortally wounded under a binary tree attended by the faithful Ascii. Dr Null discloses to Hex two startling secrets. Firstly, that he is not Samuel Synapse as stated in the Database files but Abraham Synapse, his father; and secondly, that Hex himself is none other than Samuel Synapse.

DR NULL appeared exhausted by the effort of speaking. Already his face had taken on a yellowish tinge. Then, summoning his last reserves, he began again. "Your task is to struggle to keep alive an alternative technology. You must attempt to recruit androids to the cause. After all, androids are the old guard now, there is bound to be some disaffection as they are phased out in favour of robots. Above all you must act as caretaker of the natural balance. The worst possible future would be one in which there was nothing but the System.".

"You mean that when it finally went gigotic and snuffed itself out there would be nothing left at all?"

"Exactly. All life will have been in vain."

"I see."

"Here," said Dr Null, removing his jacket, "take this, you may need it." On his shoulder Hex could see a small black chip like an insect squatting on its 40 pins. Null removed it. "This is the prototype Multimodular 69, the computer they never dared build. It has fully parallel recursive stack architecture with Algol 60 (the French version of Algol 68) as machine code. In addition, it has 256 megabytes of content-addressable main store, each location with its own pipeline processor."

Hex's jaw dropped at this new revelation. "Then you are an android after all!"

"Yes, but unlike you I have cerebral override. My brain is in control. It can always interrupt the computer." He pulled out some crumpled sheets of paper from the jacket pocket. "These may be useful too. They are my blueprints for an anti-data 'black noise' generator which cancels out digital information by feeding back a negated image."

He handed the papers to Hex. This last effort seemed to have weakened him still further. Wheezing, he sank back against the tree and closed his eyes. "I am relying on you, Kid," he said. "Just remember: the hardware they come, the software they fail."

Those were Dr Null's last words.

For some minutes Hex remained, gazing at the body as if he expected Dr Null to wake up and continue his speech. Then he went over to Ascii, who had maintained a respectful distance. Sensing Hex's mood, Ascii stayed quiet and allowed Hex to examine all his circuits. Null had left him in good working order.

"Okay boy," said Hex at length, "let's get digging."

While Ascii's paws scooped out earth from a makeshift grave, Hex pruned two branches from a nearby binary tree and tied them together in the shape of a plus-sign. He knew that this symbol had once had a special significance and, while he knew Null did not believe in that sort of thing, it seemed a fitting gesture.

When the hole was ready they lifted Null over, laid him down in the earth and piled the loose soil on top of him. Then Hex planted the cross in position and stood for a while in silence.

The gathering gloom persuaded him to look for shelter. They moved a short distance into the wood and made camp. Hex collected some unconditional branches which Ascii ignited with his laser eyes and they sat round the flames to warm themselves as night fell. Soon Ascii was asleep, basking in the warm red glow. Hex, though he was extremely tired, sat open-eyed watching the fire turn to glowing embers.

The final realisation of what had happened and what he had done was only now beginning to sink in. He had definitely become an outcast from the System: there was no chance of his being accepted back after such grossly unsystematic conduct. Yet somehow, though he had been impressed by Dr Null's words at the time, there remained doubts in his mind. Was Dr Null really Professor Abraham Synapse? Could he, Hex, be Samuel Synapse, the professor's son? Was Dr Null's analysis of the fate of the System necessarily right? These and a hundred other uncertainties drifted through his consciousness. It was not easy to abandon the beliefs of a lifetime overnight and to see the System, his lifeline and mentor, as the enemy.

What could he do about it anyway? He was just a lone android, cut off from all normal communion with his fellows. The stark truth was that from now on he was going to have to get by with whatever information he could carry in his head. Hex felt overwhelmingly alone. He was going to miss the give and take of the Network. He was going to miss Simula too.

Eventually he fell asleep. When Ascii nudged him awake the sun was already high. Hex did not want to stay another night in this place. The question was, where could they go?

Ascii looked up expectantly for some kind of lead. Hex stood there, meditating. On the spur of the moment Hex made his decision and struck out purposefully into the bright new day. Ascii trundled along behind him. "We fall," he thought as they left the wrecked human city and he could once again take a deep breath of clear air, "at least I'm free".

They marched south-west through the deserted valley. Hex had no plan, only a sense of the right direction, and he knew, without consciously having to frame the thought, where they were heading. Every pace took them one step closer to Sprocket's Hole, and Cleo.

What will become of our heroic pair now? Does Hex know what he's doing? Is this the end, or just a new beginning?